Journal of FORESTRY

MARCH 1951

Volume 49
NUMBER 3

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Journal of Forestry

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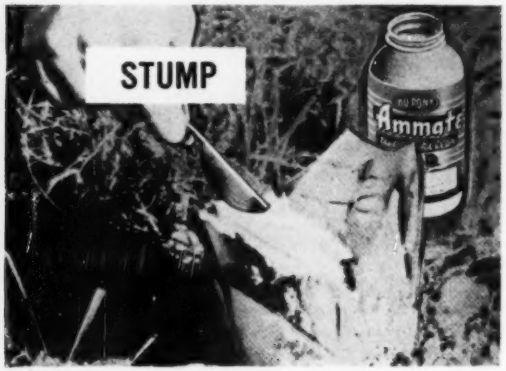

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Journal of Forestry

Official Organ of the Society of American Foresters

Human Values of Forests[1]

An Editorial by Tom Wallace
Louisville Times, Louisville, Ky.

THE LATE DR. GIFFORD of the chair of tropical forestry of Miami University merely hinted at a fact when he said: "even some foresters believe that the most important function of forests is providing mankind with wood."

A distinguished educator, some years before, declared timber the essential material of civilization.

A distinguished educator a few years later said that even if mankind could find substitutes for wood that would wholly replace that material in all of its known or subsequently discovered uses, civilization could not endure, mankind could not survive, without forests.

Possibly John Ruskin was borne on wings of fancy when he wrote of North Europeans a paragraph about the influence of forests upon men:

"The tremendous unity of the pine absorbs and moulds the life of a race.

"The pine shadows rest upon a nation.

"The northern peoples, century after century, lived under one or other of the two great powers of the pine and the sea, both infinite.

"They dwelt amidst the forests, as they wandered on the waves, and saw no end nor any other horizon.

"Still the dark green trees or the dark green waters, jagged the dawn with their fringe or their foam.

"And whatever elements of imagination, or of warrior strength, or of domestic justice were brought down by the Norwegian or the Goth against the dissoluteness or degradation of the South of Europe were taught them under the green roofs and wild penetralia of the pine."

But any historian may point out deserts where brimming rivers once bore the traffic of prosperous populations, and where nowadays neither human life nor animal life can subsist.

Scenes which inspired music like the song of the Volga Boatman, or Old Man River now are brilliant only to those of the caravan who contemplate the stars.

Cicero, who compared great trees with great arts, was imaginative, but the man who points out what erosion did in the Tigris and Euphrates valleys may be the counterpart of a county agent.

Joyce Kilmer and George P. Morris (whose "Woodman spare that tree" is perhaps the most quoted line upon the subject of trees) were sentimental. But Senator Weeks, father of watershed forests, was practical.

Humboldt who likened trees to men because men and trees, as individuals, live and die was not discussing forests, which live and do not die; which are if not destroyed by man, everlasting.

The tree has social values but the forest prevents famine.

Trees contribute immensely to the quality of literature, especially poetry and oratory, which are among the finer flowers of literature, but forests make it possible to grow crops, to float ships on oceans and inland waters, to clothe and shelter mankind.

Ingersoll, at the graveside of his beloved brother, said "in every storm of life he was oak and rock."

Churchill — not Winnie — declared that the English oak when dead commanded the flood.

Keats referred to the green-robed senators of the mighty woods.

But students of siltation know the forest as the great barrier against utter desolation all of the way from the lakes which are the sources of the Nile to the truck patches under the shadow of the mosques of Cairo and the Ras-el-teen palace in Alexandria; as the determining factor in the problem of human welfare in the valleys of Asian rivers and in the Mississippi Basin.

A poet sings of the forest giant who "showeth his might on a wild midnight," when storms howl through his branches.

A farmer who knows his business, fences his livestock out of his woods and builds his barn or renews his residence with material which, but for his foresight he would have to buy in a distant market, paying the freight on his purchase.

When, less than a generation ago, the roof of Westminster Hall, the world's largest wood-supported roof I believe, was rebuilt with oak from the farm that provided the oak with which it was built originally, one of the human values of the forest was illustrated; one of the countless human values the forest has.

When Stradivarius used a forest product to create violins which made his name immortal; when a naked African war chief fashioned from wood the first war club that bashed in the head of the opposing warrior the wide range of wood as a utile material was illustrated. But the forest is forever of far greater value than wood, the tree, multiplied by millions, is far more than timber.

Forests are the foundation of human life, the cradle of culture, the source, and part of the scene, of all that has given to the world its every art, and all of its music, from that made by the warbling and the whirring wings of birds to that written by Mozart and Beethoven, and the heroic music of

[1] Paper presented at the annual meeting, Society of American Foresters, Washington, D.C., December 16, 1950.

bugles and drums when legions march with eagles on their banners. And every skyscraper city that now exists, and every city in which nowadays, "the lion and the lizard keep the courts where Jamshyd gloried and drank deep" was produced by forests.

Confucius said, 2,000 years ago: "Let the land bring corn and the years bring peace."

There can be no peace without corn, no corn without forests.

King Solomon, whose wisdom is a legend, but was not a fact, did not understand the relationship between forests and water. He employed 80,000 woodchoppers, exported timber, impoverished his kingdom.

Many persons, when they think about human values of forests think about paddling canoes under leafy arches, shooting squirrels in woodlands, picking wildflowers, hiking trails, or think with the late Madison Cawein of Louisville that "There is no music that is half so fine as the lilt of the brook under rock and vine and the loveliest lyric I ever heard was the wildwood note of a forest bird."

It behooves us to meditate upon the more profound effect of forests on human life.

In fourteen sculptured lines a great poet, Shelley, tells a tale of a civilization which, literally, dried up and blew away, as civilizations have done from time to time in both hemispheres because they did not know the value of forests.

I refer to a poem which begins: "I met a traveler from an antique land."

The traveler described a broken statue of a monarch into the lines of whose face an artist put the pride and the passions of the typical ruler of antiquity. Upon the pedestal were these words:

"My name is Ozymandias, King of Kings:
Look on my works, ye mighty and despair."

The traveler reports that "round the decay of that colossal wreck, boundless and bare, the lone and level sands stretch far away."

Obviously Ozymandias didn't know the A.B.C. of human values of forests.

The politician, the engineer, the tractor manufacturer, knowing more than they know of the human value of forests would set them ahead of dams as guardians of human welfare, unless, of course, seeing profit in building $50,000,000,000 worth of dams, they would remain respectively the politician, the engineer, the tractor builder, primarily.

I fear that the politician, seeking votes of the barren spectator, causing the judicious to grieve, the engineer, devoted to the practice of his profession, inspired by the majesty of his works, the tractor maker who is not in business for his health, or yours or that of the United States, are perhaps forever Amber.

Editor's Note

Beginning with this issue of the JOURNAL OF FORESTRY, *a series of guest editorials on pertinent and timely subjects will appear as a regular feature. The first of this series is Tom Wallace's philosophical discussion of human values of forests which he gave before the Golden Anniversary Meeting of the Society, December 16, 1950.*

The Society of American Foresters—Its Contribution to Our National Economy[1]

William L. Hall
Forester, forest manager, and operator, Hot Springs, Ark.

In 1940 at the Fortieth Anniversary Meeting of this Society, Ralph S. Hosmer, a Charter Member and Fellow, presented an Historical Summary of the activities of the Society during the first forty years of its life. Particularly, Hosmer emphasized the services the Society had been able to render to its members, collectively and individually, in strengthening them for the task they had assumed. That task, in short, was the protection and development of the forests of our country to meet the needs of our nation.

Another decade has passed. We stand now midway in the Twentieth Century. The Society has continued its services to foresters on our continent, as well as to foresters in other lands.

It is my privilege to point out some of the accomplishments of foresters in our country during the past fifty years under the stimulation, guidance, and standards of this Society. It is freely acknowledged that understanding citizens who are not foresters have contributed greatly to the results. But it has been foresters and to a great extent it has been members of this Society who have thought out the plans, shaped programs, organized the work, and directed it to successful accomplishment.

The programs of forestry so organized and put into operation have already done much for our nation. They promise to do more in years to come.

The seven foresters who met in the office of Gifford Pinchot on November 30, 1900 to organize this Society could not foresee the great developments that have been realized but they did have visions of great things to come. Is it too much to say that this Society of American Foresters with its constantly increasing membership, its high standards in every phase of forestry, its regular meetings, its hard-working Council and committees, its organized Sections covering all the United States, its variety of professional activities; is it too much to say that its contribution to our industrial economy has been very large?

Let us consider some of the important developments, taking them by decades, through this fifty-year period.

1901-1910

At the beginning of this period the Cornell School of Forestry and the Biltimore Forest School were operating. The Yale Forest School got under way in the fall of 1900. Trained foresters were soon to become available in small numbers. By 1910 at least eight universities and colleges were giving training in forestry.

Excepting white pine and northern spruce which had been studied by Pinchot and Graves, little was known in 1900 about our forest trees—their extent, volume, characteristics, growth. What was known was mostly in the heads of farmers, lumbermen, and builders—men not much given to scientific observation or recording what they knew. In 1900 a field party of the Division of Forestry made a study of Douglas-fir. It was not known then whether new forests of that species could be grown to take the place of virgin forests.

Thus forest education and research had their beginning in the early years of this period or just prior thereto.

The U. S. Division of Forestry expanded rapidly under the inspiring leadership of Gifford Pinchot. Its main activities, 1900 to 1904, were forest and tree studies and cooperative plans for forest management and tree planting. Much publicity attended these activities as well as the advance being made in forest education. Interest in forestry was growing rapidly.

Early in 1904 a proposal was advanced in the Bureau of Forestry that the situation was ripe for the holding of a great forestry congress in Washington. The proposal was quickly accepted and plans put under way. The American Forestry Association gave hearty approval and accepted the sponsorship of the congress. The association and the Bureau of Forestry largely developed and worked out plans. The response throughout the country was thrilling. Leaders in the fields of education, science, and industry gave strong support. The press cooperated most helpfully. The congress was held early in January 1905, with an attendance of some 500. Almost every state in the Union was represented.

High point in the congress was an afternoon session held in the National Theater at which President Theodore Roosevelt gave one of his greatest addresses. He was a powerful advocate of forestry. The theater was filled to overflowing, with a large number of Members of Congress in attendance.

At that time legislation was pending in Congress with advanced status to transfer the forest reserves from the Department of the Interior to the Department of Agriculture. The Forestry Congress gave the last push needed to put this legislation through. It passed within a few weeks.

The Division of Forestry in the Department of Agriculture had become the Bureau of Forestry in 1901. In 1905 the Bureau of Forestry, by Congressional action, became the Forest Service. Under that name it has served with dignity and national approval through forty-five momentous years. The forest reserves were renamed "national forests."

From that time, the national forests were increasingly under the direction of trained foresters. The main difficulty was they were too few. They gave heroic service, often under the most trying conditions.

[1] Paper presented at the annual meeting, Society of American Foresters, Washington, D. C., December 14, 1950.

Not only were existing forests to be studied and reorganized, there was need for tremendous expansion of area and for many new forests. This reorganization and expansion of the national forests overshadowed all other activities in forestry in the last half of this century's first decade.

There were, however, other activities that were important and must be mentioned.

Referring to the need for research, it was found that for many tree species, some occurring in great volume, there was small knowledge of the quality of their woods. The trees were with us but how to use their wood most advantageously was unknown. Therefore forest products investigations got under way.

No one knew at first how to go about that program. The story of how we did go about it and the final workout of plans is well told in a little booklet published earlier this year by employees of the Forest Products Laboratory, at Madison, Wis. Its title is, *Toward Wiser Use of Wood*. It's an intriguing story. The laboratory was opened on June 4, 1910.

As an example of its service to our nation and to other nations I refer to the visit of thirty-two specialists from eleven European countries to the laboratory in September of this year. They met its personnel and inspected its facilities. They wanted to see for themselves the way research goes on at the laboratory. What a tribute to our country for its wisdom in dealing with its forest resources!

Another great movement toward forestry took shape and came near to fruition in the first decade of this century. It was the movement to extend by purchase of lands the protection of national forests on the critical watersheds of eastern rivers. The movement culminated in the enactment of the Weeks Law early in the second decade.

The Society with fifteen Active Members and thirteen Associate Members at the end of 1900, increased to 154 Active and forty-five Associate Members and one Honorary Member as of December 31, 1910.

The foundations of our nation's forestry policy were largely laid in the first decade of the century. They were: Forest Education, Forest Research, National Forests, and The Society of American Foresters. All these agencies and activities advanced substantially in the first decade; also, state forestry activities had their beginnings.

Much of that advancement was due to the dynamic personality and matchless leadership of Gifford Pinchot, one of the great Americans of the first half of the Twentieth Century.

Near the close of this period Col. Henry S. Graves succeeded Gifford Pinchot as head of the Forest Service.

1911-1920

At the beginning of this decade graduates in forestry were coming from Yale and at least seven other forestry schools, but not in numbers sufficient to meet the needs on national forests, of federal requirements other than on national forests, of the rapidly increasing and growing schools of forestry, and of state forestry activities. In some cases men without forestry training could fill gaps temporarily but they could not visualize the opportunities in forestry or help to plan programs to meet the needs of the states and the nation. The men who graduated from forestry schools between 1910 and 1920 played an heroic part in the advancement of forestry.

National forests continued to grow. State forestry organizations expanded their programs rapidly. At least ten states set up forestry agencies during this period. Organization of forest fire control by the states in cooperation with the federal government and private landowners had its beginning.

The program of land acquisition under the Weeks Law made substantial progress. Forestry education made rapid advance as did the forest products research program.

Most of this advancement came in the early part of the decade. Then in 1914 came World War I. It did not greatly affect foresters in the United States until 1917 when our country became involved. During the last four years of this period its influence on forestry and foresters in the United States was very great.

Many foresters enlisted in the fighting services. Many enlisted in the 10th Engineers, others later in the 20th Engineers. Both units engaged in supplying the combat services with lumber and other forest products from the forests of western Europe.

Two members of this Society, Col. Henry S. Graves and Col. William B. Greeley, directed these operations in Europe, with great credit to our nation and to our profession.

Forest industries in the United States also made an incalculable contribution to winning World War I. Our forests, too, contributed heavily. So great was that contribution that our most available forest areas were hit very hard. The importance of wood as a vital war material was tremendously emphasized.

After that conflict ended there was much discussion throughout our country as to whether other materials could be substituted for wood in our economy, or how we should proceed to solve our forest problems on a nation-wide scale.

Some maintained we would be compelled to move in the direction of wider use of substitutes for wood if we were to continue our advance as an industrial nation. After much thought and sometimes heated discussion the view prevailed that the wise course was in the direction of restoring our somewhat depleted forests and building them back to a good condition of productivity. It was foresters, and I will go further and say it was, for the most part, members of this Society, who led the nation and the states to this conclusion. Of course they had the full cooperation of many understanding and sympathetic citizens and legislators.

So we came to the end of our second decade as an organization

with deepened interest in forestry on the part of our nation, the states, and some timberland owners.

But there had developed among members of our Society as well as among non-members and legislators a wide divergence of view as to procedure. Should we try to advance in forestry under a plan of federal regulation of forest management on private lands or should the initiative rest with private forest owners, with such aid and cooperation as the states and federal government might give? That was a hot and unanswered question in 1920.

Through the thirty years that have elapsed it has remained a subject of widely divergent views and sometimes heated discussion by members of our Society.

In 1920 our membership, including all classes, had increased to 486 (as of December 31 of that year). Interest was increasing in federal and state forest activities and for the first time private owners were giving considerable attention to the possibilities of forestry.

1921-1930

Col. William B. Greeley had succeeded Col. Henry S. Graves as head of the Forest Service on April 15, 1920. In his first annual report, that for the year ending June 30, 1920 Col. Greeley stated that organizations of various industries had begun to canvas the forestry situation; in some cases by forestry committees of their own. Among these, the American Paper and Pulp Association took the lead. Its committee did much painstaking work and brought out two reports, the first at its annual meeting in November 1919, the second at a meeting on April 15, 1920. The latter report carried the title, *The Next Steps in the Forestry Program.* Both reports were printed and widely distributed.

Meanwhile other associations also were considering a broadened forestry program for the nation; among them the Western Forestry and Conservation Association, the National Lumber Manufacturers Association, the Association of Wood-using Industries, and the Newsprint Service Bureau.

On October 15, 1920, a conference was called in New York City, by R. S. Kellogg, secretary of the Newsprint Service Bureau to discuss legislation "for the purpose of establishing a National Forestry Policy in cooperation with the states and owners of timberlands, that will ultimately result in continuous forest production upon land chiefly suitable therefor, with a view to furnishing an adequate supply of timber for the use and necessities of the people of the United States." Represented at this meeting were: American Forestry Association, American Newspaper Publishers Association, American Paper and Pulp Association, Association of Wood-using Industries, Chamber of Commerce of the United States, National Lumber Manufacturers Association, National Wholesale Lumber Dealers Association, and U. S. Forest Service.

On December 8, 1920, at the office of the Chamber of Commerce of the United States, in Washington, D. C. representatives of the participating associations again met and effected a permanent organization. It designated for itself the name "National Forestry Program Committee." R. S. Kellogg was elected chairman.

This committee functioned through a period of more than eight years. It was largely instrumental in the passage of these laws: The General Land Exchange Act in 1922, the Clarke-McNary Act in 1924, the McNary-Woodruff Act, April 1928, and the McSweeney-McNary Act, May 1928.

This legislation greatly broadened and strengthened the basis for forestry in the United States. It provided for consolidation of national forest lands. It provided a broader basis for purchase of lands under the Weeks Act. It laid a stronger foundation for cooperation between federal government and states in fire protection. It authorized purchase of land on navigable watersheds suitable for timber growing. It authorized forest experiment stations and systematic inventories of our country's forest resources. It provided a more secure basis for financing research in forest products.

To R. S. Kellogg, a Fellow in this Society, great credit is due for these results. He served as chairman of the National Forest Program Committee through the eight years of its activity. He was chairman in fact as well as in name.

In other directions than federal legislation 1921-1930 was a period of great development. National forests were widely extended and built up rapidly.

Regional forest experiment stations were established and large programs of research begun. Work started on forest inventories. The states made great progress in forestry organization and programs of fire protection and other activities. Progress in the states fully matched the advancement made by the federal government.

Forestry schools increased in popularity, in numbers, and in attendance. Demand for foresters grew stronger. Consulting foresters were in demand.

For the first time large timberland owners began to study carefully the possibilities of forestry and to take first steps toward forest renewal.

Membership in the Society of American Foresters increased from 486 to 1,740 in this decade.

1931-1940

With 1930 came the great depression. At first, it hurt foresters as it hurt all others. This is vividly shown in our membership records. In the four years 1930-1933 our gain in membership was only 273. In the next four years, 1934 to 1937, the gain was 2,139. The years 1930 to 1933 was a period of great industrial quietness. Out of this period came the National Recovery Act movement, the Civilian Conservation Corps, and its activities. It was a dramatization on a nation-wide scale of what forestry is and what it can do for our country. It focused attention of timberland owners and foresters alike on the possibilities of forestry.

Even today we can see in the forests the results of that work.

It was largely a forester's job. It could not have been put under way or carried on without the imagination, organizing ability, and technical knowledge of foresters.

There followed great expansion of state forestry programs of fire protection and development of forest tree nurseries, with increased cooperation on the part of the federal government. The Soil Conservation Service steadily expanded its forestry operations.

In 1934, the last of the forested states established an organization for forest protection. I blush to admit that I refer here to my State of Arkansas. But I may say that during the past sixteen years she has done much to overcome her slow start. Many foresters and others now visit Arkansas to see its managed forests, both federal and private, note their importance in our economy, and observe the high development of our forest industries. But in this, Arkansas is only trying to keep abreast of her sister states which are favored with great forest resources.

In this decade the Society of American Foresters increased in membership from 1,740 to 4,708, including all grades.

1941-1950

In this last decade all forestry agencies have functioned with expanding programs and increasing efficiency. Federal and state administrative programs have been strengthened and enlarged. Educational institutions have expanded their forestry programs. Research in forestry has steadily advanced. It is now giving much vital information to foresters, forest landowners, and forest operators.

The August 1950 *Forestry Digest* carries figures and a chart showing 87.4 percent of our forest lands now under organized fire protection. The protected acreage is given as 569,169,000. Area burned in 1949 is stated as 2,635,622 acres, or 0.466 percent.

The outstanding feature of this fifth decade, without question, has been the advance in forestry by individual and corporate timberland owners. To this advance all agencies heretofore mentioned have contributed. We see the last element of our National Forestry Program getting into position to take its important part.

It must have been confidence in private ownership to assume its full part in our National Forestry Program that influenced members of this Society in its recent vote, with a substantial majority against federal control of private timberlands.

Promptly after this action Congress has moved to make available to timberland owners assistance in management on a larger scale and through the states. This action appears to be in line with legislation and developments of the last two decades.

What part have members of this Society had in these great developments of the past fifty years?

Who have thought out and shaped into acceptable form the legislation that Congress and the states have enacted to form the basis of our advances in forestry? Who but members of this Society, aided by well-informed citizens and interested members of Congress and state legislators?

Who but members of this Society have shaped the action programs in education, research, forest fire protection, forest planting, forest management?

Who but members of this Society have planned and worked out on the ground our great system of national forests?

Who but members of this Society have established the schools of forestry for training foresters for their big job.

Who are inventorying our forests, putting into effect programs of fire protection, research, forest management with its diverse problems? I answer, members of this Society.

In 1909 a biographer [2] of Theo. Roosevelt, writing of our forests, made this comment: "'Three generations ago the American forest covered an area of a million square miles, one-third of the land surface of the United States. Now there is not enough timber left to last the generation playing marbles in the school yard.''

Who blasted that prediction? I answer, the Society of American Foresters and its members, with understanding citizens cooperating.

In looking back over the record that has been made it is well to remember that foresters are trained to think and plan in terms of long years ahead and that this facility on their part has also enabled them to give leadership in other conservation fields such as soil conservation and watershed protection.

Cannot it be fairly and truthfully said that the Society of American Foresters and its members have during these fifty years made an enormous contribution to the economy and welfare of our nation?

As of November 30, 1950 our total membership has increased to 7,038.

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[2] Vrooman, Frank Buffington. Conservation Magazine, XV:692. Nov. 1909.

Oak Wilt

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OAK WILT is a lethal disease that is being viewed with increasing concern, particularly since its discovery in locations considerably to the south and east of the previously known infection centers, (*1, 2, 3, 4*). With the realization that the disease is no longer confined to the woodlots of the Upper Mississippi River Valley but is now present in southern Missouri, southern Illinois, northern Arkansas, northwestern Indiana, and Ohio, and at one location in central Pennsylvania, foresters, plant pathologists, lumbermen and the general public are worried regarding the possible threat that this disease presents to the vast oak timber areas of the South and East.

Distribution

Until the summer of 1949, oak wilt was known only in southeastern Minnesota, southern Wisconsin, Iowa, northern Illinois, and near St. Louis, Missouri. In 1949 it was reported as far south as Butler and Texas Counties, Missouri, and Pope County, Illinois, and as far east as Lake, Porter and Jasper Counties, Indiana. A survey for the disease by the Division of Forest Pathology, Bureau of Plant Industry, Soils, and Agricultural Engineering, U. S. Department of Agriculture, in cooperation with state and private foresters, during the summer of 1950, has revealed that oak wilt is widely distributed in southern Missouri and occurs in northern Arkansas, as far south as Logan County. Its occurrence in southeastern Nebraska (Richardson County) and in Lake and Coshocton Counties, Ohio, has also ben verified (Fig. 1). The disease was found at one location in Mifflin County, Pennsylvania, by state authorities.

Susceptible Species

All species of oak thus far subjected to infection, either under natural conditions or by artificial inoculation, have proved susceptible (*2, 6, 10, 12*). White oak (*Quercus alba* L.), northern red (*Q. borealis* Michx.), scarlet (*Q. coccinea* Muench.), northern pin or Hill's yellow (*Q. ellipsoidalis* Hill, southern red or Spanish (*Q. falcata* Michx.), shingle (*Q. imbricaria* Michx.), bur (*Q. macrocarpa* Michx.), blackjack (*Q. marilandica* Muench.), chinquapin (*Q. muehlenbergii* Engelm.), pin (*Q. palustris* Muench.), willow (*Q. phellos* L.) post (*Q. stellata* Wangenh.) and black (*Q. velutina* Lam.) have been found naturally infected in the field. Trees ranging from 1 to 30 inches d. b. h. have been known to die of wilt. Swamp white oak (*Q. bicolor* Willd.), eastern red (*Q. borealis maxima* (Marsh.) Ashe), swamp red (*Q. falcata* var. *pagodaefolia* Ell.), Gambel (*Q. gambelii* Nutt.), Oregon white (*Q. garryana* Dougl.), turkey (*Q. laevis* Walt.), laurel (*Q. laurifolia* Michx.), chestnut (*Q. montana* Willd.), water (*Q. nigra* L. and *Q. nigra* forma *hemisphaerica* (Willd.) Trel.), basket or swamp chestnut (*Q. prinus* L.), English (*Q. robur* L.), Shumard (*Q. shumardii* Buckl.), Texas red (*Q. shumardii* var. *texana* (Buckl.) Ashe), cork (*Q. suber* L.), and live oak (*Q. virginiana* Mill.) have developed

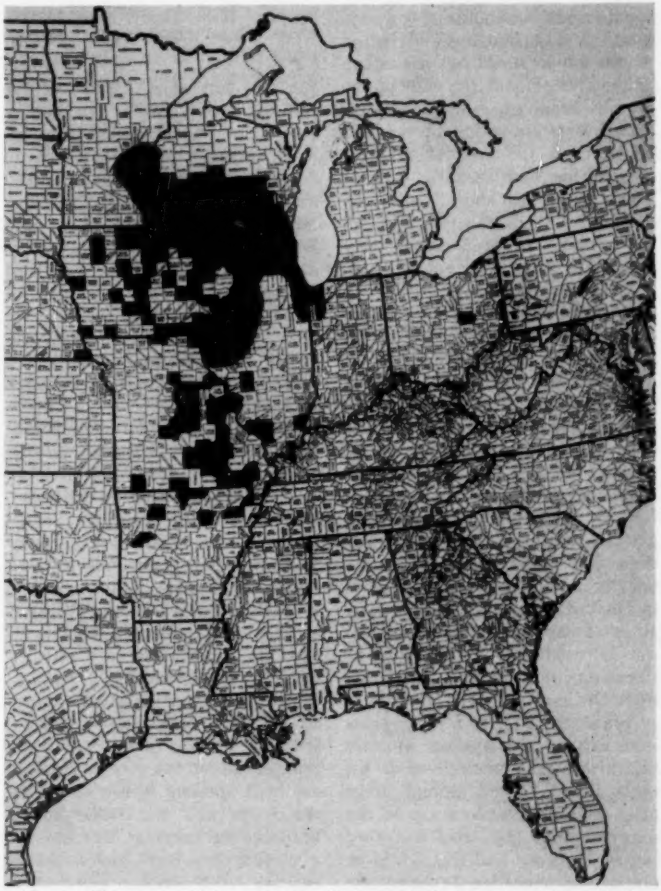

FIG. 1.—Known distribution of oak wilt in the United States, October 1950.

typical oak wilt symptoms when artificially inoculated with the fungus. Observations is Wisconsin, Minnesota, and Iowa indicate that the disease is especially severe on trees of the red oak group. White and bur oaks are somewhat more tolerant to infection and may live for a number of years after becoming diseased. A recent report from Illinois (*3*), however, states that infected bur oaks have been observed to die within a single growing season.

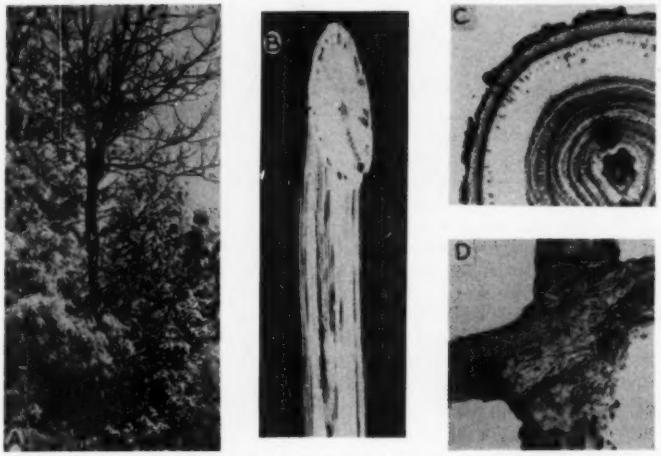

FIG. 2.—*A*, Black oak which died following inoculation. *B*, An infected black oak twig with bark removed, showing discoloration. *C*, Cross section of black oak stem showing discloration in the outer rings. *D*, Roots of white oak, showing anastomosis. (From Henry, Berch W., C. S. Moses, C. Audrey Richards, and A. J. Riker. Oak wilt: its significance, symptoms, and cause. Phytopath. 34:636-647. 1944.)

Symptoms

Oak wilt symptoms vary with the kind of oak affected and depend upon the time of year in which initial infection occurs. When infection in red and black oaks occurs during the spring and summer, the first noticeable symptom is a slight curling and fading of the older leaves near the top of the tree or near the ends of the lateral branches. A progressive bronzing or browning of the leaf blade, from the apex or margins toward the base, usually follows. These symptoms rapidly develop downward and inward through the crown. Affected leaves may fall at any stage of symptom development and moderate to heavy defoliation may result. Often only a few weeks elapse between the appearance of the initial symptoms and complete or nearly complete defoliation (Fig. 2, A). In some cases, sucker growth with dense clusters of large, succulent leaves appears on the trunk and larger branches following the orginial foliage symptoms. This new growth, however, soon wilts and dies. The foliage symptoms are usually accompanied by a brown to black discoloration in the outer rings of sapwood. This discoloration is revealed as an intermittent streaking or a diffuse browning when the bark is peeled from twigs or branches (Fig. 2, B). In cross section the discoloration appears as a brown ring or circle of brown spots in the outer annual rings (Fig. 2, C). Discoloration of the sapwood may be due to other causes, however, and this symptom cannot be considered diagnostic for oak wilt alone. Trees of the red oak group usually die during the same year in which they become infected, often within 30 to 60 days after inoculation. Occasionally, however, trees infected late in the year may survive over winter. Such trees leaf out partially the following spring and then die soon afterward. No cases of recovery have been observed in trees belonging to the red oak group and sprouts from wilted trees die, preventing regeneration by this means.

The leaf symptoms of oak wilt are much more localized in the white oak group. Individual branches in any part of the crown may develop leaf symptoms, while leaves on the unaffected parts of the tree remain green. The affected leaves may be light tan or brown or dark green and somewhat water-soaked in appearance. The leaves tend to remain on the affected branches after they die. Discoloration of the outer sapwood appears to be more commonly associated with the disease in the white oak than in the red oak group. Because oak wilt spreads rather slowly in the white and bur oaks, killing branches in varying degrees over a period of several years, "stagheading" is a common occurrence. However, reports from Minnesota (*5*) and Illinois (*3*) state that bur oaks may die without the development of "stagheads," sometimes within one growing season.

Cause

Athough oak wilt was probably observed in the Iowa-Wisconsin-Minnesota area 20 or more years ago (*8*), its cause remained obscure until 1942 when it was shown to be caused by a fungus (*11*), subsequently described and named *Chalara quercina* Henry (*7*). The fungus is a typical vascular parasite, growing largely in 1- and 2-year-old xylem. It reproduces by means of small spores (endospores) produced inside the tips of fertile hyphae. The conidia and the mycelium of the fungus have been observed within the xylem elements. It has been demonstrated that the vessels of both white and red oak are large enough to permit the passage of the spores (*12*). In red oak this suggests that the spores may be carried in the transpiration stream and probably accounts for the very rapid distribution of the fungus throughout infected trees of this species. *Chalara quercina* has been isolated from the vascular tissue of the roots, bole, branches, twigs, and leaves

of red oak at the time the first leaf symptoms develop (*9*). In white oak the vascular elements are shorter and more occluded with tyloses, which may impede the movement of the spores and account for the slower and more restricted development of the disease in this species. The fungus may persist for several years in the crowns of infected bur and white oaks and in the roots of red and black oaks for at least one year. *Chalara quercina* isolated from one oak species can infect other species. Therefore any tree affected by oak wilt may be a source of inoculum for other neighboring oaks.

Spread

There are at least two methods by which oak wilt is transmitted from diseased to healthy trees. One of these is a progressive movement from tree to tree, in restricted areas and in a more or less concentric pattern, through natural root grafts between individuals of the same species (Fig. 2, D) (*10*). Methods of transmission over distances greater than those accountable to root grafts are not yet known. The fungus has not yet been observed to fruit on the surface of infected or wilt-killed oaks and, therefore, important dissemination by wind or rain appears unlikely. Infection, except through root grafts, occurs only through wounds that reach the cambium region. Insects, birds, rodents, and mechanical means have, therefore, been suggested as possible agents for long-distance transmission.

Importance

The importance of oak wilt as a potential threat to our oak timber stands is recognized. However, until more information is obtained regarding its distribution, its rate of increase in known infection centers, and its manner of spread from one locality to another, the seriousness of the problem cannot be properly evaluated. The disease not only destroys existing oak timber but also prevents regeneration by stump sprouts. Its economic importance can be determined only through research and detailed surveys.

An indication of the destructiveness of oak wilt, however, can be found in reports from areas where the disease has been active for some time. In farm woodlots in northeastern Iowa, for instance, sufficient trees were killed in 1945 to constitute almost 70 percent of the potential annual red oak growth in these areas (*6*). On a privately owned forest of 1700 acres near Oregon, Illinois, where the disease has been present for six or seven years, it was estimated that up to January 1, 1950, 50,000 board feet of lumber from wilt-killed trees has already been salvaged and that another 50,000 board feet remain for salvage in wilt-killed trees. It was estimated that if the total number of oaks killed on this tract were standing together, they would represent an area of approximately 50 acres (*3*). In certain areas of Pilot Knob State Park in Iowa, it is reported that about 38 percent of 4,895 oaks were dead in 1945 (*12*). The wood of infected trees remains structurally sound; immediate salvage of mature wilting trees is possible.

Discussion

Completely effective methods for the control of oak wilt have not yet been developed. To check local spread, any means whereby the underground movement of the fungus through root grafts can be interrupted has given promise of control. This has been accomplished by the removal of all diseased and healthy red oaks within 100 feet of diseased trees (*6*), by poisoning healthy trees bordering the wilt area (*10*) and by trenching around diseased trees to a sufficient depth to sever all root connections with neighboring trees (*10*). Sanitary measures, including the careful and complete removal of all dead and dying trees followed in subsequent seasons by the immediate removal of any newly wilting trees, have retarded the progress of the disease in some wilt areas (*10*). It has been reported that careful and rigorous pruning of all wilting branches on white and bur oaks has prolonged the life of individual trees in some instances (*6*). The results of this practice have been inconsistent, however, and its dependability remains to be determined. Although oak wilt is a killer and potentially a most serious disease, there is some room for optimism as to the fate of our oaks. In areas where the disease has been present for many years the fungus seemingly does not have a highly effective vector; if it did, one would expect oak wilt to become a sweeping epidemic. Nor do wind-borne spores seem to be importantly involved in the spread of the disease. These facts materially increase the possibility for the development of satisfactory control measures. Whether the recent upswing in oak wilt incidence is a cyclical occurrence or the beginning of a serious epidemic remains to be seen.

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American Forestry in a World Perspective[1]

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THE TITLE has a very attractive sound; but just what does it mean? I suppose it can be interpreted to mean an objective appraisal of progress in the United States from the point of view of a foreigner. If that is the object, your committee has selected a friendly neighbor. That required a good deal of courage, because everyone knows how devastating the comments of a friendly neighbor can be. Alternatively, the title may require a more subjective approach in which American forestry will be compared with forestry in other countries and other regions. Finally, one perhaps should try to assess America's position in forestry with respect to world leadership. Has the United States moved from the position of pupil to that of teacher, and if so, in what particular fields of the profession does she excel?

It seems necessary to attempt to embrace all these interpretations of the meaning of the title, but the hazards of so doing are great. Therefore, I must beg your indulgence if my remarks are open to the charge of over-simplification, or even of misinterpretation. Here I should make it clear that these observations are mine, and that they do not necessarily represent the views of FAO.

One thing is certain, and that is the necessity of viewing the American scene as it is today from the historical point of view. Otherwise, a visitor from abroad may observe much but will understand little.

Historical Review

The development of American forestry is inextricably bound up with the general economic, social, and political development of this country. The astounding rate of progress during the past century has been based on three factors. The first of these is the energy and inventiveness of the American people; the second is to be found in the American Constitution, and the free play it has given to human initiative; and third, but not least, has been the wonderful heritage of natural resources which provide the material basis for the present progress, prosperity, and power of the United States.

Among these resources the forests are of exceptional importance. While European countries, where the profession of forestry had its origin, number their forest areas in hundreds of thousands or in millions of acres, the United States possesses, and thinks in terms of, hundreds of millions. Furthermore, these vast forests are diversified in kind and most of them are potentially highly productive. In considering the characteristics of American forestry, it is important to bear in mind the huge extent of the forest estate with which it has had to deal, because this factor alone has required an approach quite different from the classical methods of Europe.

During the second half of the previous century, the American continent was opened up and settled with remarkable speed. Forests appeared to be limitless and the internal market clamored ceaselessly for more and more lumber. In keeping with the spirit of the times, government adopted policies which encouraged the rapid transfer of public lands to private ownership. Under these circumstances, it is not remarkable that a highly competitive lumber industry swept ruthlessly through the virgin forests and "let daylight into the swamp" from the Atlantic to the Pacific. No thought was given to re-establishment of the forest, nor was any serious effort made to combat the recurrent fires which fed impartially upon logging slash and standing timber.

It is idle now to blame the old-time lumbermen for the course he followed because, in fact, no other course was open to him. Furthermore, it would have taken more than human prescience to make him realize that a shortage of timber ever could occur when, so far as he knew, there was always more and more untouched forest to the westward.

But, if one goes far enough west, one reaches salt water, and even in the most hectic days a few far-sighted men understood that the tremendous pace at which forests were being devastated and wasted could not go on forever. Gradually their warnings gathered weight, and resulted in the first steps toward forest conservation.

For practical purposes the beginnings of the forestry profession in the United States can be set at the turn of the century; and, in the compartively short space of 50 years, it has developed to a point where your Society numbers more than 7,000 members.

It was natural that the fathers of American forestry should turn towards Europe, where the profession was already long established and highly developed, for their education and inspiration. From Germany came Dr. B. E. Fernow and Dr. Schenck. Sir Dietrich Brandeis, who in his retirement encouraged and guided a young man named Pinchot, and Sir William Schlich, whose textbooks were studied by early American foresters, were trained in Germany but developed their great abilities in Burma and British India. On the other hand, a European institution which contributed notably to the training of American foresters was the famous forest school at Nancy in France.

However, the decisive influence in giving American forestry its direction and form was provided by Americans, notably by Mr. Gifford Pinchot and his colleague, Dr. Henry S. Graves. These two were not alone, but each of them fulfilled a special role: Pinchot as head of the Forest Service and Dr. Graves as director of the forest school at Yale and as Pinchot's successor as chief forester.

To the foreign observer the outstanding characteristic of American forestry is simply this—that it is American. Forestry in Canada

[1] Paper given at the annual meeting, Society of American Foresters, Washington, D. C., December 14, 1950.

has similar characteristics, and in Australia and New Zealand some similarities in conditions have resulted in similarities in practice. Elsewhere, the case is very different and, in particular, American forestry differs radically in its historical development and in its present form from that of Europe.

In the older continent, the practice of forestry arose, in the first instance, and as early as the 14th Century, from the need of local communities to ensure adequate and permanent supplies of timber and firewood from forests in their immediate vicinities. This was essential because, in the then condition of roads and other means of communication, forests 50 or 100 miles away were no more help than those in the heart of Siberia.

Towards the end of the 18th Century an organized profession of forestry appeared, together with specialized forestry schools, but major emphasis continued to be placed on the intensive management of individual forests. Great progress was made in the development of silviculture, the theory and practice of working plans, and related subjects, but, in general, the object of attention was always the same, namely the individual forest of limited size. This generalization does not mean to imply that the protective influences of the forest were ignored, since very good work has been done in Europe on such problems as the control of torrents and avalanches. Another exception must be made in the case of Scandinavian forestry, where the course of development has differed in important respects from that in the rest of Europe. Nevertheless, we can associate the European concept of forest management with the idea of obtaining maximum yields from individual forests in accordance with prescriptions embodied in formal working plans. This aspect of forest management we may describe as "working plan management."

In America the problem of supplying local communities from local forests had less weight, because rapidly expanding transportation systems made it possible for Chicago to get the lumber it needed from the West Coast after the pine forests of Michigan had been cleared away. The most pressing problems confronting the early American forester were national rather than local in scope, and included the reservation of sufficient areas of publicly owned forests to ensure protection of vital watersheds, the enlightenment of the man in the street, and of the legislators who represented him, regarding the importance of forests and of forest conservation, and similar matters. These are questions, not of silviculture or of detailed scientific study, but of broad national policy. They are integral parts of the whole problem of management of natural resources in the best interest of the people, and they can properly be embraced by the term "national forest management." It was this kind of management that first engaged the attention of American foresters, and it is the concentration of effort in this broad field that explains the significant influence foresters have exercised in the development of the general movement towards conservation of all renewable natural resources.

On the technical side American foresters were faced with an enormous problem in the battle against forest fires. Here again the situation was quite different from that in Europe where, because of climatic conditions, because very large unbroken forests are the exception rather than the rule, and because of the attitude of the people, fire is a lesser menace than it is here.

Forestry in the United States, instead of developing gradually to meet needs apparent to everyone, plunged into battle against entrenched private interests in order to protect the public interest. In the field, the struggle against fire also gave rise to a militant attitude. Thus, the American forester became a crusader and developed a selfless devotion to a great cause. If his attitude could not properly be called aggressive, it was at least far removed from passive acquiescence in the status quo. Such an attitude required, above all, a high idealism. On the other hand, it carried with it its own weakness since, by definition, it was the antithesis of the cool scientific detachment which might be considered by some as the hallmark of the professional man. If we can applaud the efforts and the victories of American forestry during its early years, it is also permissible to smile at some of the extravagant statements of the propaganda which, in justice let it be said, helped to make those victories possible.

Especially during the first decade, the history of American forestry was very much the history of the U. S. Forest Service. Here the brilliant leadership of Gifford Pinchot and the powerful and effective support of President Theodore Roosevelt will always be remembered with gratitude and with respect—180 million acres of national forests, dedicated to the public interest, remain as a monument to their vision and to the success attending their efforts to translate that vision into reality.

The first half of the second decade witnessed a change in the administration, and in policy at the highest level. Then came World War I, which inevitably retarded progress in forestry as well as in a good many other non-military fields. These ten years can be considered as a period of consolidation, and of review of accomplishments up to that time.

The period between the first and second world wars was one of steady development for the forestry profession. Emphasis shifted from the political struggle, propaganda (using that much abused word in its proper sense), and organizational problems, to the development of a sound professional basis for a form of forestry best suited to the needs of this country. All those broad subdivisions of forestry which are recognized in other parts of the world were brought under careful examination and review. None were omitted; but, in practice, the relative emphasis placed on various activities differed radically from that to be found, for example, in continental Europe.

Under American conditions it

was inevitable that protection from fire should take precedence over silviculture and that the development of satisfactory communication systems should be considered of more pressing importance than refinement of systems of forest regulation. This did not mean that silviculture, regulation, and many other aspects of scientific forestry did not receive steadily increasing attention throughout the period under review; but it does mean that these matters were necessarily subordinated to the creation of conditions under which they could be put into practice.

The inter-war period saw many other important changes. Many of the individual states established forest services of their own, educational facilities were multiplied many times, and perhaps most noteworthy of all, industrial forestry grew from very modest beginnings to an important place in the general forestry picture. At the same time, the Society of American Foresters grew steadily in numbers and in influence to a point where it could make its voice heard wherever and whenever matters affecting the welfare of the forest estate were considered.

From the economic depression of the early 30's, forestry received a tremendous impetus because the public interest was captured by the accomplishments of the Civilian Conservation Corps, organized under the direction of President Franklin D. Roosevelt. Thus did forestry reap advantage even from misfortune.

During the past ten years the American forestry profession has taken its full and rightful place as an essential part of the national economy, in war and in peace. It is no longer a newcomer fighting for existence, but a fully accepted member in the councils of the nation, with all the responsibilities that that status implies.

So much for historical review. We must now endeavor to find those characteristics of American forestry which are especially striking to an observer from another country. Probably first place among these characteristics should be allotted to the tremendous amount of research which has been and is being undertaken in the United States.

Characteristics of American Forestry

If we include forestry and forest products research, then the amount of work being done in this country by the Forest Service, by private foundations and educational institutions, and by the wood-using industries, probably surpasses the combined programs of all other countries in terms of expenditure, numbers of persons engaged in research activities, and extent and diversification of programs. Several features of this research are uniquely American. One is the continuing effort to link up forestry research with research in forest products. Another is the willingness (and the ability) to venture considerable sums of money on almost any line of investigation that seems likely to be profitable, and the corresponding willingness to accept the inevitability of failure every so often. It is not flattery but merely fairness to note the way in which American authorities have taken failures, not as a deterrent but as a stimulus to further efforts. The successes achieved have amply justified this attitude. If certain aspects of forestry have overshadowed others on the practical and administrative side, this cannot be said with respect to research. Every aspect of the broad subject seems to have received attention, and this intensive study will undoubtedly yield rich dividends. Meanwhile, it is encouraging to note that all the research authorities with whom the speaker has discussed the matter are convinced that not nearly enough is being done.

Another outstanding feature is the application of mechanization to forestry operations. This tendency is to be found alike in logging operations, fire protection, plantations, road building, and many other activities. American forestry equipment is unquestionably developed to a point far in advance of that to be found elsewhere. It is true that some brilliant inventions have been made in other countries but, as soon as they come to the attention of American foresters and loggers, they are brought here and, if found suitable, they are promptly adapted to meet American conditions.

It is interesting to consider why mechanization has been carried so far forward in the United States while some other activities, such as silviculture, are not yet so far advanced. The answer lies in two facts; first, the forest resources are large in comparison with the size of the population and, second, wage rates are high. Under these circumstances it is inevitable that great efforts should be made to obtain maximum production per man-day. In contrast, there are less fortunate countries with immense populations and limited resources where maximum emphasis must be placed on maximum production per hectare of land.

Another phenomenon which cannot fail to impress the visitor is the very large number of forestry schools offering degree courses. Visitors from certain countries may be surprised to find that these schools are completely free from governmental control, and many of them operate without support of any kind from public authorities. As a result, there is no complete standardization of curricula and, indeed, the question as to what constitutes the most useful curriculum for undergraduate studies is one on which there are wide differences of opinion. Here, as in so many aspects of American forestry, the situation is fluid rather than stabilized. Many changes have already taken place and many more are to be expected in the future. In such a situation there is danger that changes may sometimes be made merely for the sake of change; but, under existing conditions in this country, this danger is more than offset by the willingness and ability to adapt educational methods to the changing needs of the forestry situation.

In two of these three fields—research and mechanization — the United States has unquestionably achieved a leading position in world forestry. In forestry education, also, the leading American schools are at least equal to the

best to be found elsewhere, and in certain departments they excel.

There are other aspects of the American forestry scene which are not so favorable in comparison with conditions elsewhere. Excluding limited areas treated on an experimental basis, American silviculture cannot yet compete with European practice, except perhaps in matters relating to artificial reforestation. This means, of course, that the productive capacity of the forest soils is not being fully used. This is not remarkable in view of the extent of American forests, and also because so-called second growth timber is still in competition with the products of virgin forests of high quality. It seems likely that during the second half of the present century, commercial operations in virgin forests will come to an end, and it is to be expected that a typical American form of silviculture will be in widespread operation in less than 50 years. In fact, a good deal of silviculture is already practiced on the national forests and there are more than 2,500 privately owned forests, classified as tree farms, which represent a major contribution by industrial forest owners to the future supply of wood.

The battle against forest fires is far from being won. Perhaps this menace never can be completely eliminated, but the fact remains that annual losses from fire remain far too high in spite of great improvements in presuppression, detection, and suppression techniques. The very large numbers of fires caused by human carelessness each year continue to be a blot upon the national forestry record.

Losses from injurious insects and tree diseases continue at alarmingly high rates in spite of great efforts to control them. Here at least the factor of day-to-day human carelessness does not enter, although prevention of imports of infected plant materials continues to require the utmost vigilance.

Current and Future Outlook

Shortly after World War II the U.S. Forest Service published a Reappraisal of the Forest Resources of the United States, which included estimates of future requirements and the ability of available resources to meet them. Much publicity has been given to the fact that utilization of timber of sawlog size exceeds estimated annual growth by a wide margin. On the other hand, it has been estimated that total growth in cubic feet is approximately equal to total drain. The observer from abroad may well feel that the estimated overcut of sawtimber is based upon current standards of utilization which are subject to change. For example, a visitor from Sweden, where excellent lumber is produced from logs averaging not more than 8½ inches in top diameter, might feel that the replacement of virgin forests by young and fast-growing stands might be something less than a national calamity. But the reappraisal indicates that, in terms of cubic feet, there is a serious overcut of the coniferous portion of the forest against which is credited a surplus of growth in the broadleaved stands. Even though new means for utilizing hardwood are constantly being discovered, this deficit on the softwood account does seem to be a truly serious matter.

Incidentally, the American passion for reducing all arguments about forest volumes and growth to terms of board feet could easily lead a foreigner to the conclusion that people in this country think forests are made up of sawn lumber instead of trees.

The current Forest Survey of the United States is a brilliantly conceived and highly efficient technical operation directed towards securing specific information demanded by the Congress, at minimum cost. In brief, this information may be summed up as a restatement of the forest areas, estimation of volumes of standing timber, estimation of annual growth, and comparison of that growth with annual drain.

So far as I am aware, the Survey does not attempt to determine, on a national or regional basis, what the allowable cut, or possibility, may be. It is a well-known fact that allowable cut, as judged from the forest management point of view, may differ very greatly from net increment. In a virgin forest it will necessarily be much greater than net increment, which is zero. Alternatively, proper management of cut-over forests may require that annual drain should be held at a figure well below net increment in order to give the forest an opportunity to improve. In view of the fact that the coniferous portion of the forests of the United States is being overcut, according to the best available figures, it is permissible to wonder whether the time is not rapidly approaching when forest surveys must include estimates of the silvicultural requirements of the various stands as a basis for determining the permissible rates of cutting in different regions; rates which will, on the one hand, prevent further forest devastation and, on the other, permit forests to restock to a point where the potential productive capacity of the forest soils can be realized on a perpetual basis.

I believe that in the national forests this aspect of management is fully realized. It remains necessary to extend it to privately owned forests.

The tree farm movement and the progress towards better forest management made by many of the larger industrial companies have already been mentioned. Unfortunately, that progress has not been paralleled by several million owners of small forest properties who, between them, control a very substantial portion of the total forest area of this country. Here lies a practical problem which must be solved if the United States is to enjoy, 50 years from now, the generous supply of forest products which its forests are capable of yielding.

It is interesting to note that current estimates indicate that average annual growth in the forests of the United States is in the order of 30 cubic feet per acre, or about 2 cubic meters per hectare. It is also estimated that, with the introduction of more intensive forest management, average annual yield per hectare can be raised to 4 cubic meters, and that this amount

will be needed to satisfy the nation's needs at the end of this century. Statistics from countries where forestry has long been practiced, when considered in the light of the favorable geographical location of the United States in the southern half of the Temperate Zone, suggest that the estimates quoted are eminently reasonable. Nevertheless, the task of bringing most of the forests into a well-managed state confronts the American forestry profession with a challenge as great as any it has had to meet in the past.

In meeting that challenge American foresters will, no doubt, continue to draw upon experience in other lands, which will willingly be made available to them because of the great help and assistance they have afforded to others. The record of the United States in international cooperation in forestry, including the support given to the Forestry and Forest Products Division of the Food and Agriculture Organization of the United Nations, stands second to none; and it is hoped that the bread so generously cast upon the waters will return again in full measure.

In conclusion, it would be idle to deny that mistakes have been made during the past 50 years. These you have recognized, and you have been spared the misfortune of a specious reputation for infallibility. But the profession has gained for itself something infinitely more valuable, namely, a solid reputation for honesty of purpose and honesty in practice. Much has been accomplished in that spirit, and the tasks of the future can be undertaken, not only with determination but with confidence that the high goals the profession has set for itself will, in time, be reached.

Effects of Clearcutting Understory Hardwoods on the Growth of a Shortleaf-Virginia Pine Stand[1]

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The adverse effects of hardwoods on reproduction of pine are now well proven. An allied question is whether a pine stand benefits in growth from the removal of understory hardwoods. Eleven-year results on an experiment in a pine stand typical of the Tennessee Valley area indicate a negative answer to this question.

A SIMPLE EXPERIMENT was designed to test the effect of cutting the entire hardwood understory in a pine stand on the increase in basal area. The test was located in an old-field pine stand with a rather heavy hardwood understory near Norris, Tenn. In 1938, three 1-acre plots were laid out, each partly on a ridge top and partly on a slope of 40 percent to the north and east. The soil was Clarksville clay loam. The pine stand was a 26-year even-aged mixture of shortleaf and Virginia pine, with shortleaf dominant on all plots. The hardwoods, chiefly oaks, hickory, sassafras, dogwood, and sourwood, averaged 41 years in age and were distributed evenly under the overstory pines.

The indicated stand history is this: Before the turn of the century the area had been cleared of forest and cultivated for a number of years, followed by pasture use. During the next period the area reverted to hardwood forest. Then a fire swept through, opening up the hardwoods so that a good stand of pine seedlings became established. With no recurrence of fire, this pine developed to overtop the older hardwoods and form a fairly well-stocked stand.

In 1938 an initial inventory was taken on the three 1-acre plots. Essential stand data are presented in Table 1. The entire stand of trees over 0.5-inch d.b.h. averaged 107 square feet in basal area. Of this 57 percent was shortleaf pine, 15 percent Virginia pine, and 28 percent mixed hardwoods. In the merchantable stand, pines 7 to 11 inches in d.b.h. accounted for 72 percent of the volume, larger pines 28 percent, and hardwood volume was negligible. These pines averaged 120 with a volume of 5,400 board feet per acre. The height of dominant trees averaged 50 feet, with an indicated site index of 80 feet. Hardwoods ran 20 to 30 feet in height, and 1 to 11 inches in d.b.h., averaging 2.7 inches.

Treatment

Understory removal was assigned to Plots A and B, and Plot C served as untreated check. In 1938 virtually all hardwoods over 0.5 inch in d.b.h. were cut with an axe (Fig. 1). Also, suppressed pines were cut to eliminate from the even-aged stand trees that would die early in the experiment. The cut on 2 acres totaled 1,592 understory hardwoods and 234 small pines. This material was salvaged for firewood; brush was lopped and scattered. After understory removal, the residual pine averaged 7.9 inches in d.b.h. on the treated plots in contrast with the 6.1-inch pine and 2.7-inch hardwoods on the untreated plot.

In 1942, the plots were exam-

[1] Contribution from the Forest Management Investigations Section, W. H. Cummings, chief. Acknowledgment is due to E. G. Wiesehuegel for planning, to the late George S. Perry for establishment, and to other personnel of the TVA Division of Forestry Relations.

TABLE 1.—NUMBER OF TREES, BASAL AREA, AND MERCHANTABLE VOLUME OF PINE AND HARDWOODS IN THE INITIAL STANDS TREATED AND AFTER 11 YEARS ON 1-ACRE PLOTS[1]

Treatment plots	Total stand over 0.5 inch d.b.h.						Merchantable pine stand			
	Trees—number			Basal area—sq. ft.			Trees—number		Volume—bd. ft.	
	1938			1938			1938		1938	
	Initial	Leave	1949	Initial	Leave	1949	Leave	1949	Leave	1949
					Pine					
Treated, A	323	191	182	75	66	88	107	134	5,200	10,400
B	320	218	208	83	75	103	139	176	5,800	12,400
Average	321	204	194	79	70	95	123	154	5,500	11,400
Check, C	356	356	236	73	73	97	115	154	5,100	10,800
					Hardwoods					
Treated, A	953	1	20	36.0	.7	2.1				
B	645	5	17	25.8	.6	1.0				
Average	799	3	18	30.9	.6	1.5				
Check, C	739	739	816	28.6	28.6	40.0				

[1] Total stand includes trees over 0.5 inch d.b.h.; merchantable pine stand includes trees over 7.0 inches d.b.h. with volume by International ¼-Inch Log Rule.

ined. Hardwoods on the treated plots had sprouted prolifically, as was expected. These hardwood sprouts were cut back to eliminate any competition with the pine.

Final remeasurements were taken just before the 1949 growing season (Table 1). In 1950, 8 shortleaf pine and 11 Virginia pine just outside the plots were felled and measurements made of growth in height, diameter, and volume, and changes in form class and site index. To complete the picture of understory hardwoods, a count of stems less than 0.5 inch was made on 16 milacre samples.

Results

The 11-year growth of the pine stand was not affected by cutting of the understory (Figs. 1 and 2). The basal area of pines over 0.5-inch d.b.h. increased 35 percent on the treated plots and 32 percent on the check. The merchantable volume of 5,500 board feet per acre on the treated plots increased 107 percent in 11 years, or 540 board feet annually. The check plot volume of 5,100 board feet increased a total of 113 percent, or 520 board feet annually. The similarity in stands was further brought out by the size of the merchantable pine, which averaged 10.3 inches in d.b.h. on the treated plots and 10.1 inches on the check.

Hardwood development during 11 years was as follows: On the check plot, hardwoods increased 40 percent in basal area and from 739 to 816 trees with average d.b.h. of 3.0 inches. On the treated plots the very small amount of basal area more than doubled itself and stems increased from an average of 3 per acre to 18, with a d.b.h. of 4.0 inches. These data are for the stand larger than 0.5 inch-d.b.h. Smaller hardwoods on the treated plots totaled nearly 8,000 stems per acre. This growth of hardwood sprouts was virtually absent on the untreated plot. No reproduction of pine was found on any of the plots.

Removal of suppressed pines in the original stands approximated the mortality which took place over

FIG. 1.—Untreated plot (A). *Left:* in 1938, after removal of understory hardwood and suppressed pine. *Right:* in 1949, showing 11 years growth of pine and prolific hardwood sprouting.

the 11-year period. On treated plots an average of 117 pines was cut and only 10 additional died during 11 years. On the check plot, the mortality of all pines totaled 120 trees. Ingrowth of pine into the merchantable stand on the treated plots averaged 32 trees, compared with 39 trees on the check.

The merchantable pine on all plots reflected the following changes during the 11-year period: Height growth of shortleaf pine was 8 feet and Virginia pine 10 feet. Site index of shortleaf pine proved to be 73 feet in 1949, compared with 80 feet in 1938; the form class for both pines increased from 77 to 79 percent during the 11 years. However, these changes are not considered significant.

FIG. 2.—Untreated plot (C) in 1949. The hardwood understory is prominent but did not retard the growth of pine during the preceding 11 years.

Discussion

The initial basal area on the three 1-acre plots averaged 107 square feet. On both treated and untreated plots the hardwood understory was 28 percent, and the pine 72 percent of the basal area. The treatment of cutting hardwoods reduced basal area 28 percent, and cutting suppressed pine an additional 8 percent. The trees were removed by axe rather than poison, girdling, or fire in order to give immediate effects without altering site conditions. During the following 11 years hardwoods averaged 2 percent of the total basal area on treated plots, and increased only 1 percent to 29 percent on the check plot. Concurrently, the basal area of residual pine increased 35 percent for the treated plots and 32 percent for the check.

It is concluded from this study that the hardwood understory did not increase or decrease the growth of the overstory pine. The costly removal of non-merchantable hardwoods is not recommended for any similar old field stands in the Tennessee Valley region.

Correction

On page 861 of the December 1950 JOURNAL OF FORESTRY, the second sentence of the third paragraph of the article, "Thinning Over-Dense Jack Pine Seedling Stands in the Lake States," became somewhat garbled by the omission of one line from the type. The sentence should read as follows: "Because of a combination of circumstances (favorable weather, excellent seedbed conditions, and a very heavy sowing rate[1]), the seedling stand was too dense from the start."

Forestry Mistakes And What They Have Taught Us[1]

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BEFORE CONFESSING the sins of the profession, may I make a confession of my own? It is not without considerable soul searching and many misgivings that I finally reconciled myself to talk on the topic assigned to me. On the one hand the action of the Program Committee in placing on the agenda of the Golden Anniversary such a provocative subject as "Forestry Mistakes and What They Have Taught Us" appealed to me as a bold and courageous declaration that the profession has come of age, that it is morally strong and technically competent to own up to its own mistakes and invites self-criticism. This is a healthy sign. Only weaklings are afraid of criticism and try to conceal their shortcomings.

On the other hand, I realize very keenly my own inadequacy to do justice to the subject. We are too close to the events of the last few decades to be in a position to assess them with complete objectivity. I recall meeting a number of years ago at the University of Wisconsin an internationally known historian who was telling me that the only history one can teach without bias and with perfect objectivity is ancient history, the history of ancient Rome, ancient Greece, or ancient Egypt. He felt that even the period of the French Revolution cannot be taught yet with entire detachment from the present-day life because human passions have not sufficiently calmed down.

This coming from an Egyptologist may be somewhat exaggerated, but still when an historian feels that no unbiased judgment can be passed on an event that occurred 150 years ago, how do you expect me, an active participant for a greater part of the 50 years in the forestry movement, and not always a neutral one, to pass judgment on what was a mistake and what was not? This becomes especially difficult when you deal in the realm of over-all policies. Was the earlier advocacy of sole federal control over private lands a mistake as claimed by some, or is the present trend of substituting for it state control or abandonment of all controls a mistake as claimed by others? We are not ready yet for the verdict. Life alone in its own time will give the answer. But adherence to this or that policy in general largely reflects the social point of view of each individual. Moreover, the ideas that agitate the thinking of our profession, such as public control or free enterprise, are not peculiar to forestry alone but permeate all levels of our economic, political, and even educational life. They are hotly discussed now and will be discussed for many years to come. We shall better confine our discussion, therefore, to a more neutral ground, namely technical forestry.

But even in the technical field, how are we going to define what is a mistake? I do not know how Webster defines the word "mistake," but in my book a mistake presupposes a course of action deliberately chosen among several possible courses that failed to accomplish the ends sought. There is attached to the word "mistake" a certain slight sense of guilt or blame for failing to exercise the right judgment. But if there is no choice, if there is only one course of action possible and it, too, results in failure, this can hardly be called a mistake in the ordinary meaning of the word. It is simply an inevitable logical sequence of circumstances over which man has had no control. It just had to happen that way and there is no use of moralizing over it by calling it a mistake or otherwise. That is why I would prefer to talk not so much about forestry mistakes, as about the conditions which hampered the early development of forestry in this country and try to understand why the foresters of that day had to act the way they did. This, it seems to me, is a more correct historic approach and a more fruitful one.

I would like to emphasize with all the force at my command that the conclusions to which I come, make no claim at finality; they are only those of a humble worker in the vineyard of forestry trying to reconstruct in retrospect the meaning, the spirit, and the tribulations of the period in which he lived.

Now, what were the conditions which confronted the earlier generations of foresters in this country?

1.—The first and foremost was *the youth of the profession.* Not so much in age as in the newness of the work. With no fund of accumulated facts upon which to build, with no standards by which to gauge our activities, it meant in the true sense of the word, turning over virgin soil. The concomitants of youth are: lack of experience, impatience with achieving results, minimizing the obstacles to overcome, a degree of intolerance, and cocksuredness. We had all that; but youth has also its virtues: idealism, enthusiasm, faith in itself, and these qualities of mind that saved in those days the profession from despairing when the going was rough. The only known remedy against the vagaries of youth is to grow up, and judging by the many gray heads in the audience, we did grow up; we acquired poise, calmness of judgment without, I hope, losing the dynamism of youth. But above all we acquired knowledge, and we are learning more every day.

2.—*Uncritical, almost slavish following of European patterns.* Lacking our own experience, it was only natural that we should seek out in those days the experience of other countries. All countries can learn a great deal from one another, provided you know how to differentiate between which is only superficiality and what is the real substance and allow for the differences in their economic, political,

[1] Paper given at the annual meeting, Society of American Foresters, Washington, D. C., December 14, 1950.

and historic backgrounds. This most of us have failed to do. Some of you may still remember how we were carried away with the idea of restoring our forests by planting Norway spruce and Scotch pine. Now, ironically enough, there are a few good plantations of Scotch pine in the Middle West, and Norway spruce grows well in many front yards and in cemeteries, but the very thought of a country that has the richest forest flora of all the temperate regions of the world of embarking on planting Norway spruce or Scotch pine because they were the species most planted in Europe indicates how little we knew then of our own forest wealth and its potentialities.

Our very first teachers were Germans. I say this not in the way of disparagement. I was a pupil of Fernow and Roth, and I consider them great teachers. But a teacher has to teach a subject, and if there is only a little fund of information of the essential kind, he teaches what he knows best; and what Fernow and Roth knew well was the German forest literature. I recall even now, with some amusement, incidents like these: Roth standing in the classroom before a blackboard developing a forest mensuration formula. Then, either because he realized the futility of what he was doing—he possessed a great deal of practical sense—or maybe because he got himself involved in completing the formula, he would abruptly stop and erase what he had written on the board and say, "Forget it, you will never have any use for it." Now, not all that we were taught was by any means useless; the principles stuck; it is their practical application, their adaptation to the realities of life of that time that were lacking. The first textbooks on forestry in this country were written in the image and content of the German textbooks. The German forest literature was rich and admirable, but blinded by its brilliance, we were not aware of the deep gulf that existed between the theory and practice of forestry in Germany itself. One, for instance, reading the numerous German books on forest regulation and forest organization would be inclined to assume that *all* German forests were managed on a strictly sustained-yield basis. In fact, of the 12.7 million hectares of forests, only 5 million hectares or 40 percent were managed on a sustained-yield basis, largely public forests; 30 percent were managed on a so-called "simplified" plan consisting mostly of an inventory just sufficient for taxation purposes or securing a loan in the bank, and the remaining 30 percent were exploited without any plan at all; in other words, nearly two-thirds of all the German forests were worked without any idea of a sustained-yield in view.

German forestry pursued for decades a policy of highest monetary returns only from two sources—wood and hunting—neglecting the indirect benefits of the forests such as amelioration of the climate, prevention of erosion, and effect upon agriculture. Germany—a country of high technological development when it came to the woods—used most primitive tools: an axe, a poor one at that, a saw, a mattock, a rake, and a shovel. Only the large commercial forest nurseries working for export were mechanized. The first shipments of white pine planting stock to this country came from these nurseries, and with them the blister rust for which we are still paying. But above all, we misunderstood the social structure upon which German forestry rested. An old friend of mine, a lumberman, a shrewd observer, upon returning from a trip to Germany aptly remarked that if the American lumbermen constituted a favored class in this country as the owners of the large estates were in Germany, if they occupied top government positions and shaped the policy of the country, determined the tariffs and kept labor under their thumbs, they—the American lumbermen—would be able to practice better forestry than the Germans. And to think that such a semi-feudal system of forestry could be transplanted to the free soil of America was the height of folly, to put it mildly. When faced with a situation for which there were no German patterns to follow, we did develop by our own ingenuity techniques that are far in advance of those of any other country having similar climatic conditions. I refer to protection from fire. Our method of detecting forest fires by aviation patrol, fire towers, prediction of the onset of dangerous fire conditions, and actual fire suppression, if not perfect, are sound. I am fully cognizant that there are still some regions which are backward in this respect and that the fire menace has not been entirely eliminated, but this is not because of lack of knowledge of how to cope with the situation.

Fortunately, the man who most profoundly affected the development of forestry in this country—Gifford Pinchot—rejected the European, especially the German, patterns and sought to build forestry on the solid foundations of the traditions and the social and economic structure of our own country. Since we stopped worshipping the false gods of German forestry, we began to make real progress, and because of the great variety of species, great divergence of climate, the high degree of technological development, and the freedom we possess, we should be in a position to make greater and more lasting contributions to the science and practice of forestry than the countries which are less fortunately situated in these respects.

3.—*Being too much on the defensive.* Forestry in this country began to emerge at a time when the country was experiencing a great expansion. New territories were opened up, land settlement was pushed by agricultural colleges, states, and land colonization companies. Land clearings everywhere; timber was being cut in large quantities and without concern for the future. It was needed to build homes for the rising new towns and villages. Anyone who then dared to advocate retaining some of the forest land for future timber growing was branded as an obstructionist to development and progress. Some in the audience may still remember the struggle we went through to prevent throw-

ing open for settlement the area now in the Chippewa National Forest in Minnesota. In the face of such an overwhelming public sentiment, the foresters of those days defended themselves by advancing a view that only the poorest land not suited for any other purpose was good enough for growing timber. We know better now. If we are to have highly productive forests, we must grow them on land not necessarily agricultural in quality but fertile enough to support vigorous plant growth. Traces of this defense complex still persist even now, as, for instance, in discussing the future needs of the country for timber products, but there is no time for it now.

4.—*Identifying forestry largely with tree planting.* In the early days, overemphasis was laid on tree planting as the main occupation of foresters. In the mind of the average American citizen, planting of trees was tantamount to forestry. As a matter of fact, we were called "tree planters." Tree planting was something concrete and tangible. Selective logging, growing stock, natural reproduction, proper distribution of age classes were too abstract and subtle ideas for the layman to grasp, and even foresters were only vaguely at that time cognizant of them. With little or no land, private or public, upon which to practice forestry, tree planting offered a chief outlet for the forester's activities. Since public sentiment was back of it and since most of the planting was to be done at public expense anyhow, nobody seriously objected to it and we enthusiastically embarked upon tree planting with a vengeance. The area in need of planting was estimated at first to be 80 million acres. We were not content to plant up merely the logged off and burned off land, but had ambitions to convert the chaparral of southern California into forests of sugar pine, eucalyptus, and whatnot, and do it of course very cheaply at about $3 an acre. We soon learned that there is more to tree planting than mere sticking a plant into a slit in the ground not previously prepared, pressing the dirt around it with the heel, and then forget the whole thing for the next 25 to 30 years, expecting to find when we returned at the end of that period a forest stand with 25 or 30 thousand board feet to the acre. Areas planted in that manner in the majority of cases had to be replanted again and again and again. We learned that to establish successful plantations, aside from preparation of the ground, the use of the right kind of planting stock, etc., the plantations needed above all care *after* the trees were planted. Planting is just the beginning; the more difficult task is ahead. We no longer talk of planting costs in terms of $3 per acre, but more in figures of 15, 18, and 20 dollars. In the meantime, the area estimated in need of planting is shrinking. It is now only 50 million acres for the whole country. In the Lake States where the estimated planting area ranged from 1 to 20 million acres—which in itself is an indication of how flimsy is the basis for such estimates—the area in need of planting has now been set at 12½ million acres. As time goes on we shall probably further reduce these estimates. In the Lake States, where the greatest share of planting has been done and probably the most successful at that—a recent survey showed only a 35 percent survival of all the trees planted before 1920—a very low survival figure indeed. No, thus far we have not made a howling success of forest planting in this country. I do not wish in the least to minimize the importance of forest planting; it will always remain an essential part of the forester's activities; but we need a new orientation as regards our whole reforestation job. Where to plant, not only in relation to soil, but especially in relation to economic and social needs? Possibly we should plant less on cut-over lands, giving nature a chance to heal the wounds there as it already has done in many places, and plant more on farms, on land subject to blow or erosion, or in the prairies to protect agricultural crops and orchards. I do not know—I am merely groping for an answer. One thing I do know, however, and that is that in the future as more and more land comes under one or another form of forest management, we shall learn to place more and more reliance on natural reproduction as the safest and cheapest method of renewing our forests in the long run.

5.—*Being ahead of the times.* In Europe, forestry came after the pinch of a timber famine had already become acute. It was an economic necessity. Cutting and the use of timber were not separate from its growing. For this reason there never was any conflict between those who cut the timber and those who grew it. In this country the forestry profession came into existence at the time when the country still enjoyed a great abundance of timber. There was still so much timber that the idea of growing it occurred to only a few. Forestry was ahead of the times, and what's more, there was not a single acre of government, state, or private timberland that was available to the foresters on which they could demonstrate the advantages of forest practice. The timber industry, then the third greatest in this country, steeped in a pioneer psychology, with many opportunities for acquiring stumpage cheaply and liquidating it quickly at a profit, and with the belief that there would always be plenty of timber, had no regard for forestry, and those who advocated it were looked upon as impractical theorists, fanatics, or "denudaties." And foresters of course looked upon every large logging operation as wanton forest devastation. A deep gulf thus separated those who used the forests and those who wanted to perpetuate them. Under the circumstances, the foresters could do nothing else but start an intensive campaign of education, agitation for getting a foothold at least on public lands, and arousing public opinion. In this campaign, foresters at times undoubtedly overstated their case, made claims that could not be supported, and made predictions that did not materialize. Some investigations into the forest situation undertaken at that time lacked often

in objectivity as they sought to prove what was intended to be proved. What the foresters did not realize then was that one cannot impose on an industry measures that, under given circumstances, are against its economic interests; that business, any business, must of necessity be motivated by economic interests and not by considerations of public welfare; otherwise it would go out of existence. I seriously question that forestry in those days could have been made to pay and that the foresters of those days did actually know themselves how it could be done. If we knew then what we know now, we possibly would not have been so insistent on the finer points of silviculture but would have been willing to accept at first some very simple, common sense practices which at least could have stopped the wastage of the resource.

Well, life has caught up with both the timber industry and foresters. Conditions have now radically changed. The word "regulation" that once was anathema to the lumbermen does not carry any more the terrifying implications, and the more progressive representatives of the industry themselves talk of the need of some form of regulation as a means of protecting the economic base of their business. The gulf that once separated the user and the grower of the wood is narrowing; the key to the progress of forestry lies in a happy marriage of forest utilization to forest conservation, and let us hope this day is not far away. There is now a growing feeling of mutual understanding and cooperation which augurs well for the future of our forests. But in this present climate of good will and cooperation, welcome as it is, we must not lower our guards in accepting glittering slogans and easy substitutes in place of genuine forest management.

6.—*Missing the boat on watershed protection.* While in our popular writings and in our public speeches we loudly proclaimed the protective value of the forests, in actual practice we have done very little to translate this belief into action. As a matter of fact, we have not played even fair with the law that authorized purchase by the government of private forest lands for watershed protection. The constitutional basis for this law was that control of streamflow is a function of the federal government, and since forests are essential to the regulation of the streams, the purchase of such land by the federal government was constitutionally proper and legitimate. But no sooner has this law been passed than we forgot its provisions and began buying all kinds of land whether it has had any relation to streamflow or not. As a matter of fact, we have even followed for a time a policy called "the worst first." The peak of the land purchases came at a time when many states found themselves burdened with tax delinquent forest land which they tried to pass on to the government at a price, and so we were buying in this or that state wherever the political pressure was the strongest. As realtors we were a great success and made valuable investments for Uncle Sam, but it is open to serious question whether we actually secured any substantial protection to our critical watersheds. Yet, next probably to China and India, we suffer annually the largest losses from floods, and our high mountain ranges are in need of watchful guarding against losing their protective cover. The whole concept of forest influences somehow has not percolated yet into the consciousness of our profession. This has been painfully demonstrated at least to me by the skepticism if not outright animosity to President Roosevelt's shelterbelt project on the part of some professors in our leading forest schools. Yet the success of shelterbelt planting stands out today as the most lasting achievement of the New Deal. Farmers know it from experience and are going on planting shelter belts—the professors notwithstanding. As a result of all this, we have lost the leadership in a field in which we were once the pioneers, and the United States is almost the only one of the civilized nations that has no specific laws defining protection forests and prescribing their treatment.

7.—*Neglecting the problems of the small timber owners.* Being preoccupied with the problems of the large timber owners as the most influential group in shaping the forest policies of the country, we were overlooking for a long time the potentialities for timber production on some 260 million acres of forest land owned by 4 million farmers and other small proprietors. The lag in bringing the woodlots into the national forestry picture was caused also by the unwillingness of many of our agricultural friends to give recognition to the value of the woodlot in the farm economy. Some agricultural colleges are not convinced even now. Within recent years considerable progress has been made in this direction. Today there are too many overlapping agencies working in this field—conservation districts, extension foresters, county or area foresters, state farm foresters, various associations of small timber operators sponsored by the large timber and pulp and paper concerns—but all apparently working without much coordination of effort to achieve the best results. The Production and Marketing Administration is spending millions of dollars in the form of subsidies to farmers for caring for the soil and improving the woodlots.

8.—*Overlooking the human element.* We delved considerably into the economics of the timber industry but were overlooking an essential element of the forest economy, namely labor and forest communities. As long as the industry was largely nomadic, moving from one region to another, the work in the woods was also of migratory, seasonal, and casual character. Permanent forestry, however, must rest on permanent, all the year 'round, work in the woods, on workers assured of their jobs, proud of their calling, with opportunities for growth and advancement, living not in temporary lumber camps but in American democractic, self-governing com-

munities. In our eagerness—very praiseworthy to be sure—to raise the standard of living of backward populations living in the forest regions of the tropics or elsewhere, we must not overlook the fact that there are still forest regions in this country, the populations of which subsist on a very low economic level. Their standard of living could be raised too by better organization and more rational management of the resources upon which they depend.

After all is said and done, when one contrasts the forest situation as it existed in this country at the beginning of the 20th Century with the one of today, one cannot stop marvelling at the remarkable progress that has been made within such a comparatively short period. In the light of these solid achievements, the missteps of the earlier days fade almost into insignificance. If the next generation will not make any graver mistakes than did the one that preceded it—and mistakes it is bound to make, because to err is human—the profession is destined to grow in prestige in the field of science, and the respect and confidence in which it is held now by the people of this country will rise to new and greater heights.

Influence of Crown Reduction on Springwood and Summerwood Distribution in Longleaf Pine

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A study was made to determine the effect of reduction of crown size on tree growth, especially its effect on wood formation in longleaf pine (Pinus palustris Miller). Severe and continued reduction of the lower part of the crown resulted in greatly reduced ring width in the lower part of the trunk. Springwood was reduced more than summerwood at the lower levels in comparison with wood formation in unmodified control trees. Higher in the trees near the lower limit of the crown, proportions of springwood and summerwood differed much less. The effect on springwood reduction in parts of the lower trunks of pruned trees was persistent for several years in the trees studied.

THIS REPORT gives results of experiments conducted by the Forest Products Laboratory to investigate the effect of reduction of crown size on annual growth in longleaf pine, especially factors influencing springwood and summerwood production and distribution in the main stem.

In coniferous trees, differentiation into annual rings depends chiefly on the different development of the same kind of elements; namely, tracheids. The power of growing in height and radially, as well as the ability to produce springwood and summerwood, is inherent in the organization of the tree, but external conditions also influence these physiological processes. Paul and Marts (*5*) have shown that the total and proportional amounts of summerwood in longleaf pine can be increased by irrigation. In natural stands the proportion of springwood is usually found to be less in small crowned, closely grown trees. Trees of like vigor, growing under approximately the same conditions, have a similar rate of springwood formation within any given classification. Development of terminal shoots and formation of new needles in 1- and 2-year old pines is, according to Möller (*4*), mainly at the expense of existing reserve materials. Kienholz (*1*) reports that certain conifers show an early surge of growth in leader, roots, and cambium at approximately the same time and that this is made possible by the great amount of readily available reserve food stored in the tree. A second surge of growth of the cambium observed later is probably associated with the development of summerwood. Wight (*7*) concludes from his observations on pine that radial growth begins uniformly in the trunk and that there is a sudden rise to a maximum of starch reserves which coincides with the period of most vigorous growth. Turnbull (*6*) concludes that springwood development is dependent mainly on reserve nourishment stored up by the tree during the previous year. He also claims that the function of springwood is inherent and that its development is internally controlled.

Production of organic compounds, which are the primary source of cell-wall building substance, is in direct ratio to the photosynthetic capacity of the tree. It is generally known that conditions are more favorable to the formation of soluble food materials in the upper parts of the crowns of trees. Korstian (*2*) has observed that cell sap is denser in the tops of trees than at the bases of trees. It is obvious that a considerable reduction of crown size would greatly affect the amount of material produced and indirectly influence its distribution and probably its storage. If such a reduction in crown size affects distribution and storage of reserves, then experiments in pruning and defoliation should show effect on wood formation, especially on the springwood portion of the ring; that is, if, as assumed, the amount

of springwood production is related to the supply of reserve food available to the cambium early in the growing season.

Experiments

Areas were selected and experiments established at the Harrison Experimental Forest near Saucier, Miss., in March 1937 and at the Olustee Experimental Forest near Olustee, Fla., in February 1938. These locations were near laboratory facilities and weather stations. The two locations were selected to allow a comparison of results under different growing conditions and to reduce somewhat the chances of destruction by fire.

Open-grown trees were selected in order to reduce root competition from other trees and to minimize the effect of shading as much as possible. Trees were selected on the basis of similarity and uniformity of growth. Ten longleaf pine (*Pinus palustris* Miller) trees were selected at each experimental area; five were pruned by removing approximately the lower three-fourths of the branches, and the other five trees were left untreated to serve for comparison (Fig. 1). Crowns of the pruned trees at the Harrison Experimental Forest were further reduced in January 1938, February 1939, and March 1941. Additional crown reduction was made on pruned trees at the Olustee Experimental Forest in February 1939, March 1941, and February 1946. Interruption of continued crown reduction, due to the war, allowed a period of recovery to the trees.

All experimental trees were felled in February 1948 and the logs were shipped to the laboratory for study. The trees were in winter condition with the 1947 growth zone completed.

Disks for growth measurements and for density determinations were cut from the trees at intervals of 4 to 12 feet up to a height of 36 feet or more. Springwood and summerwood measurements were made on a median radius corresponding to each of three specific gravity segments; the long radius, the short radius and an average radius. Average values were calculated for a radius. Measurements were made at several selected heights in the trees from the Harrison Experimental Forest and at the 4-foot height in trees from the Olustee Experimental Forest.

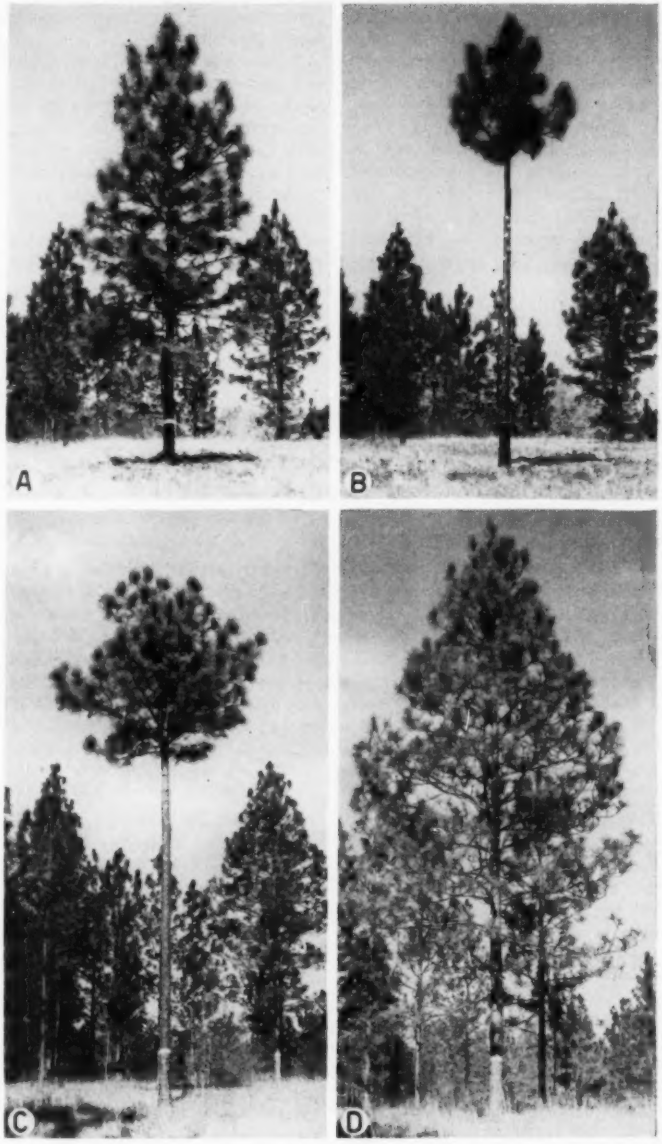

FIG. 1.—Longleaf pine tree No. 1 as it appeared, *A*, before being pruned on March 25, 1937, and *B*, on April 7, 1937, after crown reduction. *C*, Tree No. 1 as it appeared February 11, 1946; the crown was pruned in 1937, 1938, 1939, and 1941. *D*, Unpruned tree No. 2 as it appeared February 11, 1946, nearly 9 years after the experiment was started. This tree also appears in the right background of photographs A, B, and C.

TABLE 1.—DEVELOPMENT DATA ON PRUNED AND CONTROL LONGLEAF PINE TREES FROM THE HARRISON EXPERIMENTAL FOREST USED FOR STUDY OF THE EFFECT OF CROWN REDUCTION ON WOOD DISTRIBUTION

Tree No.	D.b.h.		Age when felled	Total height			Lower limit of crown				
	1937	1948	1948	1937	1939	1941	1948	1937	1939	1941	1948
	Inches	*Inches*	*Year*	*Feet*	*Feet*	*Feet*	*Feet*	*Feet*	*Feet*	*Feet*	*Feet*
							Pruned trees				
1	9.2	11.8	28	40.5	42.9	45.2	50.0	4.7[1]			
								26.5	27.8	31.3	31.5
4	10.0	13.2	31	38.8	42.2	46.9	53.5	3.6[1]			
								24.9	28.2	30.6	30.6
5	7.5	10.3	29	36.6	39.1	43.3	51.2	6.8[1]			
								24.6	27.2	28.7	28.8
8	9.0	11.8	27	35.1	37.1	39.2	46.2	4.8[1]			
								22.4	24.2	26.9	27.0
10	8.3	11.5	27	37.0	40.6	44.8	56.2	7.0[1]			
								21.0	23.1	27.2	27.2
Av.	8.8	11.7	28	37.6	40.4	43.9	51.4	5.4[1]			
								23.9	26.1	28.9	29.0
							Control trees				
2	9.4	13.2	29	41.6	44.4	48.2	56.4	4.1	6.8	7.1	9.8
3	8.2	14.0	26	37.8	41.1	45.3	55.5	3.5	3.5	4.8	4.8
6	6.4	11.6	26	31.1	36.2	37.7	51.9	7.6	7.6	7.6	14.0
7	7.0	12.4	25	32.7	34.7	41.4	50.5	8.6	8.6	9.1	9.3
14	6.5	12.3	29	41.6	44.7	48.8	58.5	9.5	9.5	13.8	16.5
Av.	7.5	12.7	27	37.0	40.2	44.3	54.6	6.7	7.2	8.5	10.9

[1]Lower crown limit before pruning.

Results and Discussion

Harrison Experimental Forest.—Diameter growth, age, height growth, and lower crown limits for the 10 longleaf pine trees from the Harrison Experimental Forest are given in Table 1 for the interval of the study. These trees, when felled, averaged about 28 years of age. During the period of the investigation, control trees increased 5.2 inches and pruned trees 2.9 inches in diameter at breast height. Control trees, during that time, averaged 3.2 feet more in height growth than pruned trees. In 1947 tree No. 10 was turpentined, and for this reason data were omitted for all trees for that year. Changes in taper and wood density observed in these trees were reported in a previous paper (*3*). Trunks of pruned trees showed reduced taper. Wood produced after crown reduction showed greater density below lower crown limits than wood produced at the same height in the trees before pruning.

Variations in average springwood and summerwood production at three heights in the trees are presented in Table 2 for intervals before, during, and after crown reduction. At the 4- and 12-foot heights, pruned trees exhibit pronounced reduction in ring width after pruning (Figs. 2 and 3). Springwood for the 5 years (1942-1946, inclusive) after pruning was 39.3 to 44.7 percent of the average ring width in pruned trees, and 46.5 to 49.7 percent of the average ring width in control trees; that is, it was less on a percentage basis at the 4- and 12-foot levels in pruned

TABLE 2.—AVERAGE SPRINGWOOD AND SUMMERWOOD WIDTHS AND PERCENTAGES FOR LONGLEAF PINE TREES FROM THE HARRISON EXPERIMENTAL FOREST

		1932-1936, before pruning				1937-1941, during pruning				1942-1946, after pruning			
		Springwood		Summerwood		Springwood		Summerwood		Springwood		Summerwood	
	Height in tree	Width	Ring width	Width	Ring width	Width	Ring width	Width	Ring width	Width	Ring width	Width	Ring width
	Ft.	*Mm.*	*Percent*	*Mm.*	*Percent*	*Mm.*	*Percent*	*Mm.*	*Percent*	*Mm.*	*Percent*	*Mm.*	*Percent*
Averages for five pruned trees		4.02	58.4	2.86	41.6	1.41	48.6	1.49	51.4	1.33	39.3	2.05	60.7
Averages for five control trees	4	3.18	50.9	3.07	49.1	3.09	52.7	2.77	47.3	1.99	46.5	2.29	53.5
Percent of control trees		126.4		93.2		45.6		53.8		66.8		89.5	
Averages for five pruned trees		5.04	70.2	2.14	29.8	1.85	54.3	1.56	45.7	1.60	44.7	1.98	55.3
Averages for five control trees	12	4.00	62.5	2.40	37.5	3.28	57.5	2.42	42.5	2.16	49.7	2.19	50.3
Percent of control trees		126.0		89.2		56.4		64.5		74.1		90.4	
Averages for five pruned trees[1]		5.95	87.0	.89	13.0	4.71	75.1	1.56	24.9	2.75	60.0	1.83	40.0
Averages for five control trees[2]	24	5.52	81.7	1.24	18.3	4.28	67.6	2.05	32.4	2.77	57.0	2.09	43.0
Percent of control trees		107.8		71.8		110.0		76.1		99.3		87.6	

[1]No data for tree No. 10 for 1932.
[2]No data for trees Nos. 6 and 7 for 1932 and 1933.

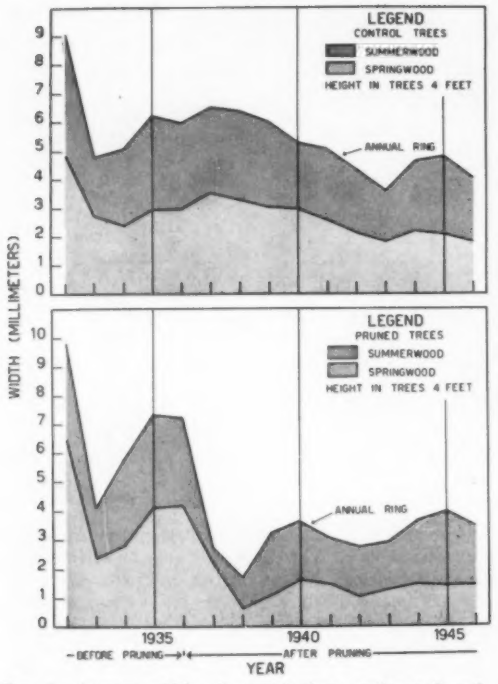

FIG. 2.—Average width of annual rings—springwood and summerwood—at 4-foot height in longleaf pine trees from the Harrison Experimental Forest. Early in 1937, the lower three-fourths of the crowns of pruned trees were removed, with further crown reduction in 1938, 1939, and 1941.

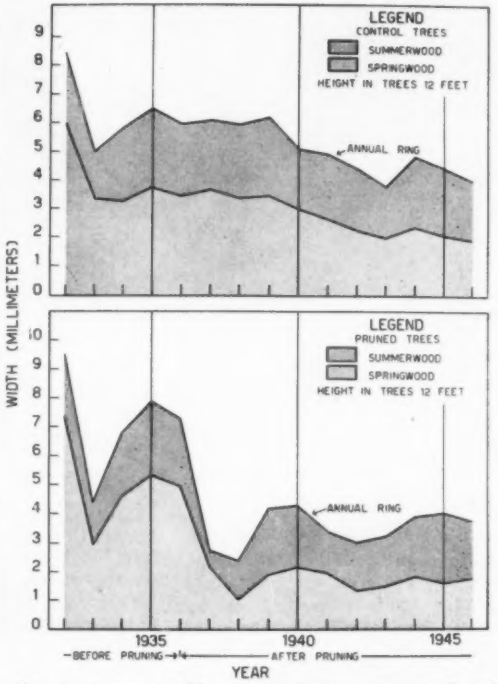

FIG. 3.—Average width of annual rings—springwood and summerwood—at 12-foot height in longleaf pine trees from the Harrison Experimental Forest. Early in 1937, the lower three-fourths of the crowns of pruned trees were removed, with further crown reduction in 1938, 1939, and 1941.

trees. At the 24-foot height, ring width (Fig. 4) and springwood percent of ring width (Fig. 5) was slightly greater in pruned trees.

Comparison of springwood percent of ring width for control and pruned trees by years (Fig. 5) showed similar trends before pruning. Pruned trees at 4- and 12-foot heights exhibited an increase in percentage of springwood after the 1937 and 1941 prunings, and a decrease in 1938, 1939, and 1942. Springwood percent showed similar trends for pruned and con-

TABLE 3.—DEVELOPMENT DATA ON PRUNED AND CONTROL LONGLEAF PINE TREES FROM THE OLUSTEE EXPERIMENTAL FOREST USED FOR STUDY OF THE EFFECT OF CROWN REDUCTION ON WOOD DISTRIBUTION

Tree No.	D.b.h.		Age when felled	Total height				Lower limit of crown			
	1938	1948	1948	1938	1939	1941	1948	1938	1939	1941	1948
	Inches	*Inches*	*Year*	*Feet*	*Feet*	*Feet*	*Feet*	*Feet*	*Feet*	*Feet*	*Feet*
							Pruned trees				
2	10.6	13.1	32	46.6	48.1	51.7	61.4	11.2[1] 28.6	29.8	33.2	35.5
5	9.2	11.5	30	42.2	45.0	48.8	56.0	11.0[1] 27.3	29.8	31.9	34.3
7	9.4	11.3	34	46.2	47.8	50.7	59.2	15.0[1] 31.4	32.2	36.0	36.2
8	8.4	11.3	27	41.6	43.3	47.6	55.8	8.2[1] 26.0	26.7	31.0	31.5
10	8.5	11.1	27	35.8	37.5	41.4	49.9	7.5[1] 22.8	24.5	27.0	29.3
Av.	9.2	11.7	30	42.5	44.3	48.0	56.5	10.6[1] 27.2	28.6	31.8	33.4
							Control trees				
1	10.4	14.9	35	42.6	44.0	46.8	53.0	11.1	11.1	11.2	12.0
4	7.5	10.8	31	40.9	41.8	44.8	55.3	6.7	6.6	6.5	16.2
6	9.4	14.1	31	43.8	44.8	49.0	56.2	11.1	11.1	11.1	17.2
9	6.7	11.5	22	35.5	36.7	41.0	51.6	8.5	8.5	8.5	12.8
11	7.1	11.7	28	36.5	37.6	40.8	47.3	12.5	12.6	12.6	21.9
Av.	8.2	12.6	29	39.9	41.0	44.5	52.7	10.0	10.0	10.0	16.0

[1]Lower limit of crown before pruning.

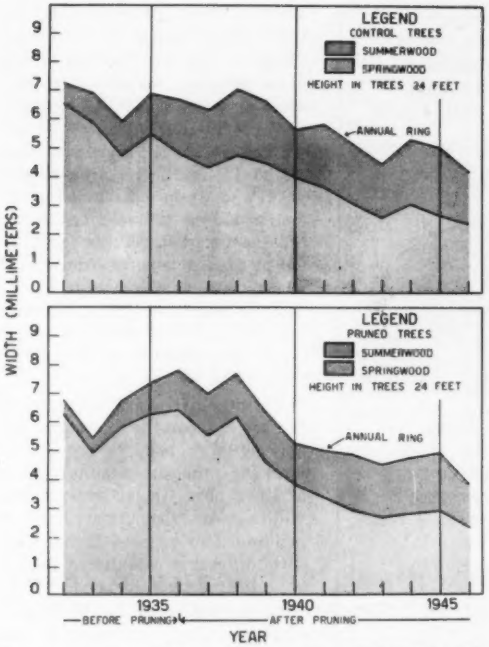

FIG. 4.—Average width of annual rings—springwood and summerwood—at 24-foot height in longleaf pine trees from the Harrison Experimental Forest. Early in 1937, the lower three-fourths of the crowns of pruned trees were removed, with further crown reduction in 1938, 1939, and 1941.

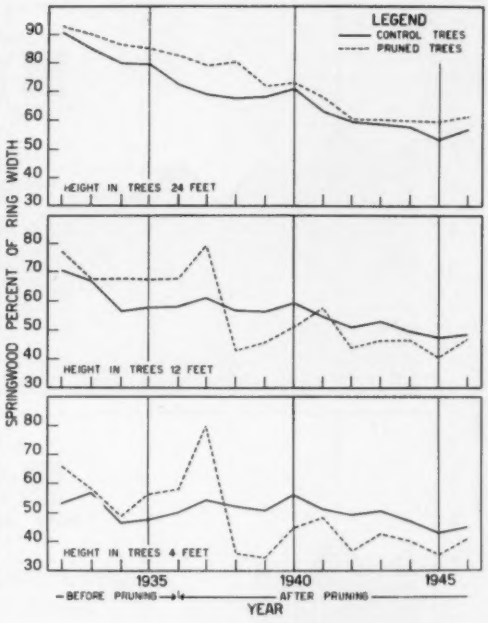

FIG. 5.—Average percentage of springwood at heights of 4, 12, and 24 feet for pruned and for control longleaf pine trees from the Harrison Experimental Forest.

TABLE 4.—AVERAGE SPRINGWOOD AND SUMMERWOOD WIDTHS AND PERCENTAGES AT THE 4-FOOT HEIGHT FOR LONGLEAF PINE TREES FROM THE OLUSTEE EXPERIMENTAL FOREST

	1933-1937, before pruning				1938-1941, during pruning				1942-1947, after pruning			
	Springwood		Summerwood		Springwood		Summerwood		Springwood		Summerwood	
	Width	Ring width	Width	Ring width	Width	Ring width	Width	Ring width	Width	Ring width	Width	Ring width
	Mm.	*Percent*	*Mm.*	*Percent*	*Mm.*	*Percent*	*Mm.*	*Percent*	*Mm.*	*Percent*	*Mm.*	*Percent*
Averages for five pruned trees	3.10	49.5	3.16	50.5	1.26	50.0	1.26	50.0	0.95	36.4	1.66	63.6
Averages for five control trees	3.16	51.3	3.00	48.7	2.74	51.6	2.57	48.4	1.70	43.3	2.23	56.7
Percent of control trees	98.1	.....	105.3	.....	46.0	.....	49.0	.....	55.9	.....	74.4	.....

trol trees at the 24-foot height for the interval of the study.

Olustee Experimental Forest.—Developmental data for pruned and control longleaf pine trees from the Olustee Experimental Forest are given in Table 3 for the period of the investigation. Trees selected averaged about 30 years of age when felled. During the 10-year period of the study, control trees increased an average of 4.4 inches in diameter at breast height and pruned trees increased an average of 2.5 inches at the same height. Height growth in the control trees averaged 3.8 feet less than in the pruned trees.

Average springwood and summerwood widths and percentages at the 4-foot height are given in Table 4 for periods before, during, and after pruning. Trends in growth (Fig. 6) were similar before crown reduction. After crown reduction, the pruned trees showed decreased ring width. Springwood for the 5 years (1942-1946, inclusive) after pruning was 36.4 percent of the average width in pruned trees and 43.3 percent of the average ring width in control trees.

Comparison of the springwood percentages of ring width for control and pruned trees at the 4-foot height (Fig. 7) showed similar trends before pruning. An increased percentage of springwood was evident in 1938 and 1941, and a decrease was noted in 1939.

Since the primary function of the crown is production of organic compounds, severe reduction in crown size reduces, at least temporarily, the amount of material produced by the tree, and indirectly affects the stored food reserves.

The results show a pronounced reduction of the annual ring widths of the pruned trees at the 4-foot height, especially during the

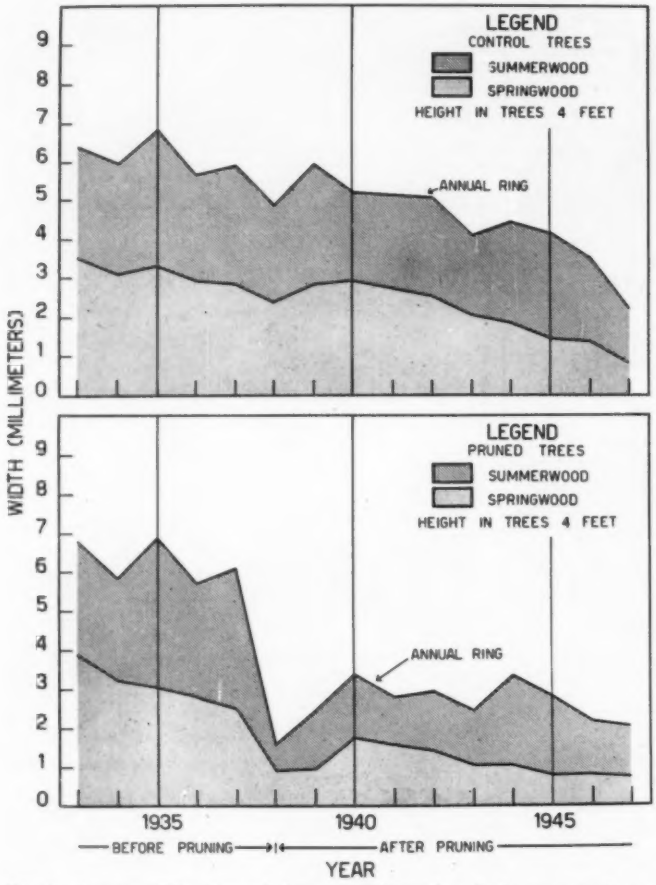

FIG. 6.—Average width of annual rings, of springwood, and of summerwood at a height of 4 feet in pruned and control longleaf pine trees from the Olustee Experimental Forest. Crowns were first reduced in 1938, and further reduced in 1939, 1941, and 1946.

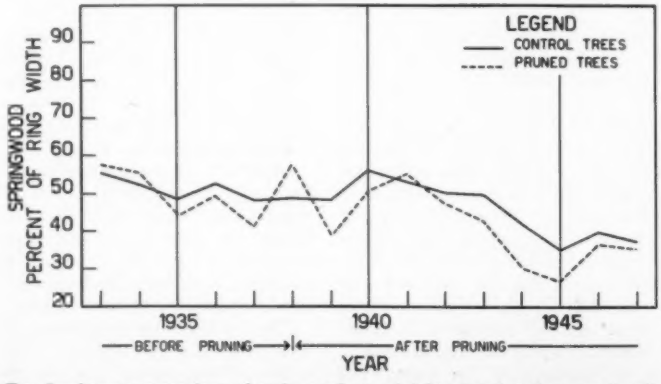

FIG. 7.—Average percentage of springwood at a height of 4 feet for pruned and control trees from the Olustee Experimental Forest.

year of crown reduction and for the year following this reduction (Figs. 2 and 6). For the period after pruning, variations in average ring width at the 4-foot height (Fig. 2) for trees from the Harrison Experimental Forest were from 4.0 to 1.7 millimeters for pruned trees and from 6.3 to 3.5 millimeters for the control trees during the same period. Trees from the Olustee Experimental Forest show variations in ring width at the same height from 3.3 to 1.5 millimeters for pruned trees and from 5.9 to 2.2 millimeters for control trees (Fig. 6).

Variations in average ring width for trees from the Harrison Experimental Forest for the 12-foot level show the same trends as those at 4 feet (Fig. 3), but average ring widths near the upper limit of pruning (for pruned trees) show little difference as between pruned and control trees (Fig. 4).

In pruned trees, for the period after pruning, springwood was proportionately less than summerwood at the lower levels in comparison with untreated control trees. Evidence of this is illustrated in the graphs showing springwood percent of ring width by years (Figs. 5 and 7). Tables 2 and 4 give average springwood widths, average summerwood widths, and percentages for periods before, during, and after crown reduction. Springwood growth patterns for control trees and trees which were later pruned show similar trends for the period before modification. Increased percent for the initial year of pruning indicates less effect on springwood, probably because of stored reserves and springwood formation in progress, since growth had already started before crown reduction.

The greatest effect on springwood production in pruned trees at the Harrison Experimental Forest appeared during the years following pruning (Fig. 5) at lower levels in the trunk, while a pronounced reduction of springwood was shown in the pruned trees at the Olustee Experimental Forest the year after pruning (Figs. 6

and 7). This reduction in springwood formation may be interpreted as indicative of the influence of reduced reserves. Increased percentage of springwood in 1941 may be attributed to the adverse effect of the crown reduction of this year on summerwood production (Figs. 5 and 7). Not counting the years in which pruning took place, the springwood percentage for the 5 years after pruning at the Harrison Experimental Forest was less in the pruned trees at the lower levels (Fig. 5 and Table 2). This was also true for pruned trees at the 4-foot height for the Olustee Experimental Forest (Fig. 7 and Table 4).

Investigations such as these aim at determination of factors affecting regulation of the growth pattern. Results offer guides to the management of future forest stands for production of wood for strength, for freedom from knots, uniformity of ring width, or for other desirable characteristics.

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The October Floods of Southwestern Oregon — Some Observations and Speculations

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FORESTS are known to have a profound effect on stream flow. They affect not only the amount and quality of water, but also the timing of flow. They do this through a number of different, yet inseparable, phenomena. Forests intercept precipitation and influence the rate of snow melt; they contribute litter and humus which absorb water and detain runoff, protect the soil, and maintain good infiltration conditions by creating a favorable habitat for soil improving organisms; forests create a rough micro-topography composed of numerous, small depressions which function as tiny detention dams; and they transpire water. Combined, these factors serve to prevent or retard surface runoff and minimize erosion. Their multiple effect can do much in regulating quantity and quality of water flows under normal meteorological conditions.

But under extreme rainfall, the effectiveness of forests in abating floods may be limited by the capacity of the soil reservoir. This was dramatically demonstrated in October 1950, by a storm and floods that occurred in southwestern Oregon. From October 25 to 27, two to five inches of rain fell. Then it really rained. In the four-day period from October 27-30, as much as 15 inches were recorded at some stations. These rains caused serious floods. Stream flows which produced devastating damages downstream emerged from relatively undisturbed watersheds as well as more developed areas, simply because it rained too much.

This conclusion was drawn from observations after the floods, and from a study of cover conditions on some of the most severely damaged watersheds. The observations were made on a number of watersheds of different sizes, physiography, and intensities of development, all in the coastal drainage system of southwestern Oregon. Some were in a virgin condition, while others have had sizable areas logged; none had any appreciable burned areas and some had no fire history. The watersheds were the South and Middle Forks of the Coquille River; Elk Creek (tributary of the South Umpqua River); the South Umpqua River; and several of the small headwater tributaries of the Illinois River, itself a tributary of the Rogue River. These areas were examined from seven to eleven days after the flood peaks had occurred. Most of the streams were approaching normal for the time of year, but runoff from natural drainages was still taking place; thus, some opportunity was afforded to observe its source.

All the watersheds visited are characterized by steep slopes and have some areas of shallow soils and rock outcrops. The extent of these areas varies between watersheds. In the Umpqua and Coquille drainages, steep, rocky slopes border the main streams which flow through stretches of narrow, gorge-like canyons. In the headwater sections and upper slopes the topography levels off somewhat and rock outcrops are smaller and less extensive. The forests here are made up mainly of dense stands of Douglas-fir with some hemlock, sugar pine, and Port Orford cedar mixtures. However, in small, localized areas of shallow, rocky soils, tree cover is less dense and brush

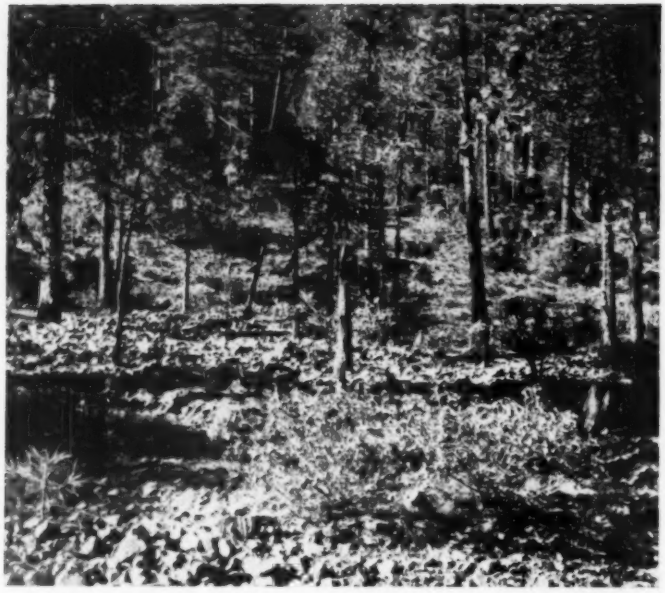

FIG. 1.—Rock wash from peridotite soils in the Whiskey Creek drainage of the upper Illinois River. Sparse natural cover of knobcone and ponderosa pines, incense cedar, and associated species is typical of cover found on peridotite soils in this area.

may dominate the site. Logging is generally confined to mature stands. Clear-cutting is the accepted practice with the size of the cut varying from large, indiscriminately laid-out blocks to small, staggered settings of 35 acres or less. Yarding is done by high lead or tractor, depending on the topography.

The contrast between these conditions and those of the upper Illinois River is striking. Here the soils are diverse, with extensive areas derived from peridotite and serpentine. For the most part, these are very shallow soils — in some places no more than a few inches deep. The vegetation is a transition between the coastal rain forests, the pine types east of the Cascades, and the brush types of northern California. It ranges from dense Douglas-fir, true firs, and cedar forests on the deeper soils to sparse knobcone pine and associated species and brush cover on the shallow, rocky soils. In this area, commercial-sized timber is found only in ravines and other situations where soil-moisture conditions are more favorable. The sparse cover and shallow soils which predominate in the area, gave rise to high rates of runoff during the October storm. Evidence of this was found at several places where small rocks had been washed from just a moderately steep slope (Fig. 1).

Many logged areas did not show signs of accelerated erosion, but most skid roads did. Even on moderate slopes it was found that skid trails had gullied badly and in some places mud outwashes had been deposited at the foot of the slope—usually on a road. Such erosion is probably a major source of stream sediment loads during and following heavy rains. Erosion from dirt access roads and drainage ditches was also found, and from cut and fill slopes where they were not protected by a tree canopy.

Though not evident in most places, logging did have its effects. Severe erosion was found at a number of places where concentration of the runoff due to logging of steep slopes had caused gullying which contributed sediment directly to the streams (Fig. 2). If the forest cover had not been removed from such steep slopes as these, the runoff probably would have been slowed down enough to prevent this type of erosion.

By a week or more after the rains, most runoff was clear; muddy runoff was unusual and where found it was traced to roads where cars or trucks had stirred up mud in water draining over the road surface. It was found that small streams could be kept continually cloudy just by an occasional vehicle passing a point where water was draining over the road. At one place, a small stream carrying silt (Fig. 3) prompted a further look at the area above. Investigation revealed that a logging road, then in use, crossed the drainage about a mile up the slope. Runoff from this road had eroded the slope below it at a number of places. At one of these, a gully which started at the head of a small opening where shallow soil prevents establishment of trees had washed away the thin soil mantle, exposing the bedrock. It was interesting to note here that erosion had not occurred under the fringe of trees directly below the road, probably because of the heavier grass and litter cover. The road grade at this point is only about 5 percent. Concentrated road runoff such as caused this gully was probably responsible, in part, for the severe gouging of the natural waterway shown in Figure 3.

FIG. 2.—Recent gully erosion from steep, non-stocked slope above Middle Fork Coquille River.

Streambank cutting was severe on most streams. Much of this was washing of fill slopes where road building had encroached on the stream channel; but cutting of the natural banks was also common, particularly where the streams meandered through flood plains. On the other hand, road bank slumping was found throughout the storm area. It seemed to bear no relation to land use or to type or depth of soil. Slumps were found practically wherever road banks were exposed; on open land as well as virgin timber; on shallow, rocky soils as well as deep soils; and on steep to gentle slopes. In some places massive boulders had been torn loose along with smaller rocks and soil material; elsewhere, masses of relatively uniform soil material seemed to have sloughed off gently.

Discussion

Observations such as these cannot be taken as conclusive evidence of flood causes or the effects of watershed cover on flood discharges. It does seem reasonable to assume, however, in view of the diversity

FIG. 3.—Gouged natural waterway above South Umpqua River road. Runoff from a road about a mile above probably contributed to the high flow which produced this scouring.

of the watersheds which gave rise to flood flows, that in this case the effects of cover were overwhelmingly obscured by the amount of rain that fell. Considering the extent of shallow soils gives further support to this conjecture. Most streams had begun to rise on October 27 following the previous three days' precipitation. During this period, soil moisture deficits were probably satisfied and most soils had reached the saturation point. Consequently, much of the following four days' rainfall which culminated with the peak discharges of October 29 and 30, undoubtedly ran into the streams directly by surface or subsurface flow.

According to local observers, all the streams were muddy during the flood stages. Surface runoff from the saturated soils probably contributed some of the silt load, but it is believed that most of it came from erosion of skid trails and other dirt roads, washing of material that had slumped from road banks, erosion from cut and fill slopes and streambank washing. Except for the last, all of these are products of road building, and hence of logging. Thus, as logging with its inevitable soil moving is extended to more of the upstream lands, the silt load of the streams may be expected to increase unless the most judicious measures for control of erosion from these sources are adopted. Some measures that might be recommended are well planned roads provided with adequate drainage facilities; stabilization of cut and fill slopes, where needed, by mulching or seeding; obliteration and herbaceous seeding of skid trails; and restriction of travel on woods roads during periods of high runoff.

Pine Hybrids Being Tested in the Southeast

At the Institute of Forest Genetics, Placerville, Calif., eastern white pine crossed with western white pine (*Pinus monticola* × *P. strobus*) shows definite signs of hybrid vigor. Seedlings of this cross, now in their third growing season are approximately three times as large as seedlings from either parent; they also flower at an earlier age. Seed of the promising eastern-western white pine cross is being planted at the Bent Creek Experimental Forest in the mountains of North Carolina to test what this hybrid will do under eastern conditions.

Seedlings of the following crosses, with shortleaf-loblolly hybrids as the seed parents, are being tested at the Hitchiti Experimental Forest in Piedmont Georgia: N. C. shortleaf—Va. loblolly, self pollinated; N. C. shortleaf—Va. loblolly, wind pollinated; and N. C. shortleaf—Va. loblolly, back-crossed to loblolly.

These hybrids are being compared with wind-pollinated loblolly pine from Louisiana and North Carolina, as well as with wind-pollinated shortleaf from Virginia.

Natural Reproduction in Certain Cutover Pine-Fir Stands of California

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NATURAL REPRODUCTION must provide future crops of timber on most of the forest land being placed under management in California. Relatively few acres will be planted or seeded in the near future because planting costs are high, facilities for undertaking large-scale planting are inadequate, and direct seeding has not yet proved satisfactory. In the pine region it is desirable that reproduction stands be adequately stocked with vigorous pine seedlings. How promising is the outlook for natural restocking? The degree of success in one important locality is the subject of this paper. It reports mainly seedling occurrence on cutover land between 1923 and 1947. The results are part of a more general study of forest regeneration in this and other localities in California.

The Study Area

The study area is located on the west slope of the Sierra Nevada in the Stanislaus National Forest. Data are from 640 milacre quadrats in five plots totaling about 50 acres. The plots range in altitude from 5,500 to 6,000 feet. The timber type is sugar pine—fir and sugar pine—ponderosa pine—fir.[2] On the basis of the average height of the dominant trees at maturity, the plots rate high in quality: Site I.

Observations were begun on the quadrats before logging. Each plot was logged once during the period of study, but the year of cutting differed for the several plots, being either 1923, 1928, or 1929. Records were continued annually or periodically from the year of logging until 1947. Because year of cutting, location, and type of cutting varied among the plots, no detailed analysis based on years after cutting is attempted. Instead the data are summarized by calendar years to show the numbers and species composition of the reproduction and the ground cover conditions on which reproduction occurred. Data relating to the changes caused by logging are summarized as "before logging," and "after logging" without regard to calendar years.

Prior to cutting, the average stand on the plots was 74,600 board feet per acre.[3] The intensity of cutting differed on the five plots, varying from a selection cut in which 40 percent of the volume was removed to a heavy cut in which 90 percent was removed. The residual volume ranged from 6,700 feet to 37,000 feet and averaged 13,700 feet. These reserve stands are considered representative of the range found after logging in the vicinity. Owing to the grouped occurrence of the original old-growth, cutting varied locally within the plots from complete clearing in small patches to removal of single trees. Logs were ground skidded with tractors except on 10 acres, where donkeys were used. The slash was piled and burned in the first winter after logging.

Species in the old-growth volume before and after logging were:

	Before logging	After logging
	Percent	*Percent*
Ponderosa pine	18	14
Sugar pine	34	29
Fir	39	48
Incense-cedar	9	9

Seed trees.—The number of seed trees within range of the quadrats indicates the possibility of reproduction better than the reserve volume. Seed-fall records show the effective seeding distance of sugar pine, the species with the heaviest seed, to be about 1½ chains for seed trees 18 to 30 inches in diameter, and 2½ chains for trees larger than 30 inches.

Within 1½ chains on either side of the line of quadrats there were 210 trees over 18 inches in diameter, or an average of 11 trees per acre (Table 1); within 2½ chains there were 114 trees over 30 inches, an average of 3.6 per acre.

TABLE 1.—NUMBER OF SEED TREES WITHIN RANGE OF QUADRATS

Species	Trees over 18 inches within 1½ chains		Trees over 30 inches within 2½ chains	
	Total	Per acre	Total	Per acre
Ponderosa pine	21	1.1	6	0.2
Sugar pine	49	2.5	26	0.8
Fir	101	5.3	60	1.9
Incense-cedar	39	2.1	22	0.7
Totals	210	11.0	114	3.6

The proportion of quadrats within 1½ chains of a pine seed tree 18 inches d.b.h. and over was 76 percent; within 2½ chains of a 30-inch pine, 67 percent; within 1½ chains of any 18-inch tree, 96 percent; and within 2½ chains of any 30-inch tree, 94 percent. Thus nearly every quadrat was within range of at least one seed of some species and more than three-fourths were exposed to at least one pine.

Considering the period as a whole, failure of seed crops probably was not a limiting factor in reproduction. Heavy pine seed crops occurred in 1933, 1934, 1936, and 1941; light crops were borne in about half the remaining years. It is considered significant that the first good crop did not occur until 4 to 10 years after logging. Also, in the absence of measures to control rodents, good seed crops are not complete assurance that adequate seed was available for germination.

[1]The authors are indebted to Duncan Dunning, in charge, division of forest management research at this station, for assistance in the preparation of the report. The observations reported here were started by him and have been continued under his supervision.

[2]Sugar pine, *Pinus lambertiana*, Dougl.; ponderosa pine, *P. ponderosa*, Laws. Fir refers to white fir, *Abies concolor* (Gord. and Glend.) Hoopes. Incense-cedar refers to California incense-cedar, *Libocedrus decurrens*, Torr.

[3]The data on volumes are from manuscript progress reports on methods-of-cutting plots, by various members of the California Forest and Range Experiment Station staff.

TABLE 2.—SPECIES COMPOSITION (PERCENT) OF ADVANCE GROWTH

Time of examination	Sugar pine	Ponderosa pine	Fir	Incense-cedar
Before logging	8	1	61	30
Immediately after logging	10	1	55	34
1947	10	1	54	35

Advance reproduction.—A potentially effective stand of advance reproduction was much reduced by logging. Advance growth, comprising trees less than 3.5 inches in diameter, occurred at the rate of 4,258 trees per acre. Logging destroyed 72 percent of these trees, leaving 1,205 survivors. Losses from other causes gradually reduced this stand to 935 trees by 1947. Species representation in the advance growth showed little change (Table 2).

Ground vegetation and surface conditions. — Ground vegetation and surface conditions on the quadrats which might affect the establishment and survival of natural reproduction were charted periodically. These conditions were grouped in four general classes: (1) Bare ground; (2) brush; (3) litter; and (4) logs, rocks, stumps, and heavy trash (Table 3). The term bare ground signifies merely exposure of the mineral soil. As the minimum area charted was 0.01 milacre—about 8 inches square—this classification does not necessarily denote freedom from competition. The area classified as brush was delineated by projection of the shrub crowns. The principal brush species were *Ceanothus integerrimus, C. parvifolius, C. cordulatus, Arctostaphylos patula, Castanopsis sempervirens,* and *Chamaebatia foliolosa.* Litter consisted of needles, duff, and small dead branches. Logs, rocks, stumps, and heavy trash were mapped by their areas as projected on the ground. Where these solid materials were inclined or raised, it was possible for seedlings to become established under them.

TABLE 3.—SURFACE CONDITIONS ON QUADRATS AFTER LOGGING

Surface condition	Immediately after logging	1935	1947
	Percent		
Bare ground	22	8	2
Brush	17	50	58
Litter	39	25	24
Logs, etc	22	17	16

Reproduction Since Logging

In the 18 to 24 years since logging, many fir and cedar, but very few pine seedlings, appeared on the study plots. Contrary to expectations, no wave of new pine seedlings came in after the stand was opened and the soil exposed under an apparently adequate number of seed trees. Brush soon invaded the open areas. Conditions now are unfavorable for much more reproduction.

TABLE 4.—INCIDENCE OF SEEDLINGS BY GROUND SURFACE CONDITIONS IN PERCENT OF TOTAL FOR EACH SPECIES

Surface condition	Sugar pine	Ponderosa pine	White fir	Incense-cedar	All species
From Year of Logging to End of 1935					
Bare ground	0	27	8	2	3
Brush	49	31	34	48	45
Litter	34	31	51	44	45
Logs, etc.	17	11	7	6	7
From Year of Logging to End of 1947					
Bare ground	2	18	9	1	3
Brush	54	46	45	51	50
Litter	29	26	40	41	40
Logs, etc.	15	10	6	7	7

Time of seeding incidence.—In no year did pine seedlings occur in sufficient numbers to form more than a minor part of the stand. The greatest number found in any year was only 85 seedlings per acre. Fir and particularly cedar, however, occurred at frequent intervals and in great numbers. Of the 10,092 seedlings found per acre during the period of observation, 84 percent were cedar, 13 percent were fir, and only 3 percent were pine. No doubt other seedlings died soon after germination and escaped detection in the usually late seasonal quadrat examinations. Because counts were not made every year, only the survivors of the years skipped were found. Previous studies[4] have indicated that cutworms cause large early losses, which are greater for incense-cedar and white fir than for the pines. The proportion of incense-cedar and white fir recorded probably would have been increased if complete germination counts had been possible.

Place of seedling incidence.—Considering all species together, seedling incidence was about in the order that the different ground conditions occurred. Of seedlings recorded between the year of logging and the end of 1935, 3 percent appeared on bare ground and 45 percent under brush (Table 4). For the entire period of study, seedlings were distributed among the surface-condition classes in about the same proportions as in the period ending in 1935.

Certain conditions apparently were more favorable for some species than for others. Ponderosa pine appeared more frequently on bare areas than did other species. Litter was less favorable for the pines than for cedar and fir. So few pines occurred, however, that these indications are not well substantiated.

Why so few seedlings were found on bare ground raises questions

[4]Fowells, H. A. Cutworm damage to seedlings in California pine stands. Jour. Forestry 38: 590-591. 1940.

TABLE 5.—SURVIVAL OF SEEDLINGS IN PERCENT OF INCIDENCE UNDER VARIOUS SURFACE CONDITIONS, BY SPECIES, 1947

Surface conditions	Sugar pine	Ponderosa pine	Fir	Incense-cedar	All species
Bare ground	50[1]	75[1]	32	20	36
Brush	18	22	49	30	32
Litter	25	18	38	23	25
Logs, etc.	7	0[1]	20	10	11
All conditions	20	30	42	25	28

[1]Based on very few seedlings.

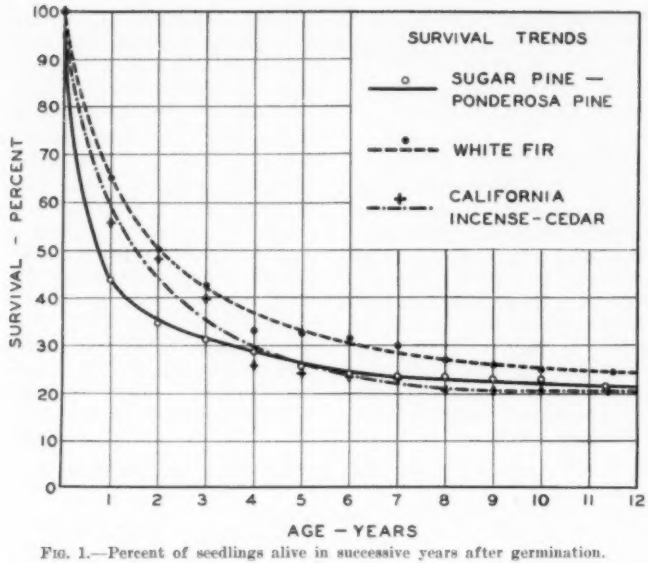

FIG. 1.—Percent of seedlings alive in successive years after germination.

which cannot be answered fully by this study, although the answers may be inferred in part. The records do not show differences in germination and early mortality between surface conditions; only a single, late-season examination was made in most years and none in some. The bare surface may have permitted germination of seedlings which did not survive to the date of examination. Located mostly in skid trails, the bare areas were heavily trampled by deer, livestock, and other animals—a rather severe treatment for any young seedling. Further, the condition of the areas classed as bare ground no doubt changed during the period of study. By the end of 1935 bare ground had decreased from 22 percent of the surface to 8 percent while brush had increased from 17 percent to 50 percent. It is possible that soil still exposed was thoroughly invaded by roots of surrounding trees and brush. Any initial advantage in favor of the bare areas, resulting from decreased competition, would have been lost by 1935. Not to be overlooked in this connection is the fact that seed—particularly pine seed—was deficient just after logging.

Seedling survival.—As of 1947, survival of all seedlings found after logging was 28 percent. This rate is undoubtedly higher than actual survival because, as pointed out before, some seedlings germinated and died between plot examinations. Of the 2,749 surviving seedlings per acre, 2.6 percent were ponderosa and sugar pines, 19.6 percent were fir, and 77.8 percent were incense-cedar. During the period of 18 to 24 years, pines became established at the rate of only 70 per acre.

Conditions favored fir more than the other species. Of the firs recorded, 42 percent lived through 1947, whereas only 20 percent of the sugar pine, 30 percent of the ponderosa pine, and 25 percent of the cedar seedlings were alive at the last examination (Table 5).

Ultimate success of the reproduction perhaps is best indicated by trends in survival with age; that is, the proportion of seedlings alive in successive years after germination (Fig. 1). General averages by calendar years include seedlings of all ages and hence obscure such trends. Mortality was high in the first 2 years of life, when one-third to two-thirds of the seedlings died. By the tenth year after germination, only 22 percent of the pine seedlings, 21 percent of the cedar, and 25 percent of the fir were alive. The decline in survival had almost leveled off by about the tenth year. Long term survival apparently may be expected to range from 20 to 25 percent of the seedlings which came in during the first two decades after logging.

Seedling growth. — Growth of the seedlings was very slow. The average height for each species at the end of 5 years was hardly 6 inches. The ponderosa pine seedlings grew more rapidly after the fifth year and by the tenth year were 3 feet tall. The other species were barely more than a foot tall at 10 years. Measurements of a few cedar and fir seedlings older than 15 years showed that growth had increased after the tenth year. Apparently tree reproduction after selective cutting cannot dominate shrubs 3 to 5 feet high in less than 10 to 20 years.

The Reproduction Stand

The composite stand of advance growth and post-logging reproduction amounted to 3,680 trees to the acre in 1947. The quality and probable development of this young growth can be judged to some extent from trends in composition and dominance, and from the distribution of the seedlings.

Species composition. — Species composition changed appreciably during the period of observation. The two pines constituted 12 percent of the reproduction in 1929, but only 5 percent in 1947; fir declined from 55 percent to 29 percent in the same time (Fig. 2). These changes resulted primarily from an increase of cedar. This species formed 35 percent of the stand in 1929, rose to a peak of nearly 80 percent in 1938, and then declined to 66 percent in 1947.

Dominance.—The species composition of the dominants probably is more significant than composition expressed in terms of all seedlings. Considering as dominants the tallest seedlings in each quadrat in 1947, 49 percent of the dominants were fir, 38 percent were cedar, and 13 percent were pine. The proportion of dominant pines

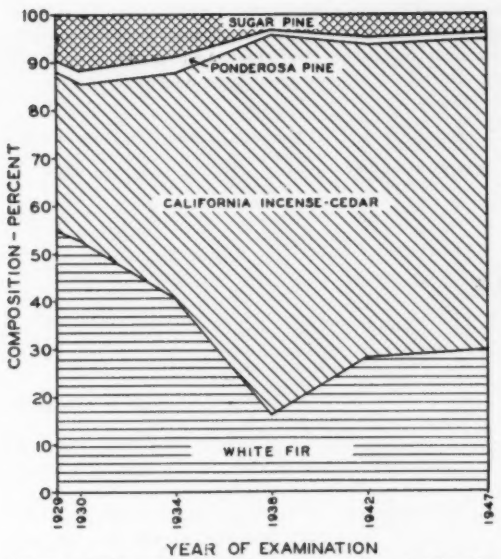

FIG. 2.—Species composition of the reproduction at intervals during the period 1929-1947.

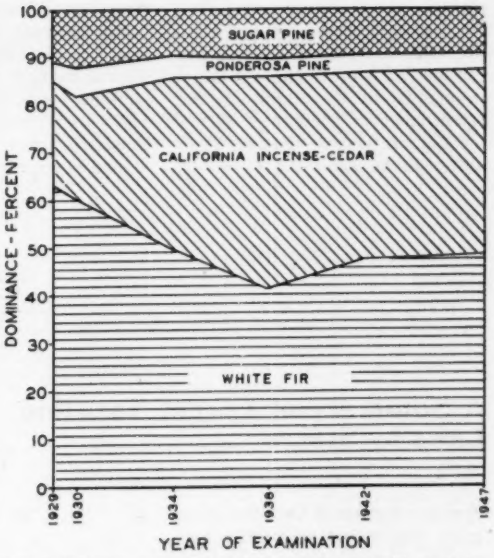

FIG. 3.—Species composition of the dominant seedlings at intervals during the period 1929-1947.

was fairly constant from 1929 to 1947 (Fig. 3). On the assumption that the dominants effectively characterize the future stand, the pine component assumes greater importance than the mere 5 percent of all seedlings would indicate.

Distribution of seedlings.—The average of 3,680 seedlings per acre does not mean that stocking was uniformly adequate. Actually, distribution was very irregular. Some 39 percent of the quadrats had no seedlings at all, and 19 percent had only one each; 21 percent had 2 or 3; and the remaining 21 percent contained more than 3 seedlings each.

Progress towards stocking to the desired standard of one tree per milacre has been slow. In 1929, 44 percent of the quadrats had at least one seedling each. By 1934, 50 percent were stocked. In 1938, after the wave of cedar reproduction, 59 percent contained seedlings. In the last 9 years, seedlings became established on only 2 percent more of the quadrats. In view of present cover conditions, it seems improbable that there will be much increase in the proportion of quadrats stocked.

Summary and Discussion

In Site I sugar pine—fir and sugar pine — ponderosa pine — fir types of the central west slope of the Sierra Nevada, seedling occurrence was recorded from 1927 to 1947, following typical cuttings. Seed trees were thought to be sufficient for adequate sugar and ponderosa pine reproduction. Pine seed trees over 18 inches in diameter were left at the rate of 3.6 per acre. One pine over 30 inches was left per acre, on the average. Seed bearing was poor in the first few years after logging but was ample for the period as a whole. Seed-eating rodents were not controlled.

In spite of the number of pine seed trees, no wave of pine reproduction followed the logging disturbance. In a period of nearly 20 years, pines became established at the rate of only 70 per acre. White fir and California incense-cedar seeded in to such an extent that pines were only 5 percent of the reproduction in 1947. A somewhat larger proportion of the dominant seedlings, 13 percent, was pine.

More than 72 percent of the advance reproduction was destroyed by logging. Of that surviving in 1947, 11 percent, or 100 seedlings per acre, were pines.

The reproduction and advance growth were not well distributed; on the basis of stocked milacre quadrats, 39 percent of the area was unstocked in 1947. Progress towards complete stocking was very slow. Brush filled the openings so that there is little hope for establishment of additional seedlings.

Growth of the seedlings was disappointingly slow; the average height attained in 5 years was only 6 inches; at the end of 10 years the pines reached 3 feet. After selection cuttings, reproduction apparently requires 10 to 20 years to overtop brush 3 to 5 feet high.

The data reported here confirm the findings and predictions of Dunning[5] over 25 years ago as to inadequacy of pine reproduction, the increase in fir and cedar, and the invasion of openings by brush. However, earlier expectations that adequate pine reproduction would gradually appear if time enough

[5]Dunning, Duncan. Some results of cutting in the Sierra forests of California. U. S. Dept. Agric. Bul. 1176. 28 pp. illus. 1923.

elapsed, are not confirmed. After 20 years, it seems unlikely that pine will continue to filter in and become dominant, forming a larger proportion of the stand. Either retreatment to encourage natural seeding or partial planting probably will be necessary to restore pines in desirable proportions.

Silvicultural methods for the mixed-conifer types must be modified if natural reproduction is to produce desirable stands in periods short enough to permit intensive forestry. Modifications designed to improve regeneration are now being tested by the California Forest and Range Experiment Station[6] and the administrative branch of the Forest Service.

[6]Dunning, Duncan. *In*, A sugar pine regeneration cutting experiment. West Coast Lumberman 76:62, 64. 1949.

A Summary of Forest Taxation Laws by States

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FOR MANY YEARS it has been recognized that forest properties have certain characteristics which in many cases demand for them special tax laws in order to distribute equitably the tax burden among all types of property. Several forms of special taxation or other legislation have been suggested and attempted. The merits of these various forest tax principles have been written and discussed at length and no attempt will be made to do so here. The intent of this paper is to indicate to what extent the various forms of forest tax laws have been applied by state governments.

Questionnaires were sent to state tax commissions and state foresters requesting information in regard to any special legislation in force or recently enacted with respect to forest properties. In many cases copies of the laws or reports in connection with them were returned. Using the above sources and the *State Forest Tax Law Digest of 1945* prepared by the Division of Forest Economics, U. S. Forest Service, it was possible to compile a table of the forest tax laws (Table 1), if any, for all of the states as of December 31, 1949.

This table is published as a general source of information on state tax laws applying specifically to forest property. The points of interest in each law are outlined only briefly. The provisions are in no way to be considered official in any state. Copies of the laws may be obtained by writing to the Sate Tax Commission of any state in question.

With the advance of forest management in the United States, more and more forest land owners have been able to determine precisely the effects of the usual property taxing methods upon the business of growing and harvesting timber. States in which privately owned forests and their products are a major part of the economy have made the most rapid advances in the search for equitable taxation of these extraordinary types of investment and earning power. Due to the demands of the forest owners and in order to preserve this important part of the economy these states were compelled to make tax adjustments. The important timber growing states in this category are Washington, Oregon, Idaho, Alabama, Louisiana, Mississippi, Connecticut, Massachusetts, New Hampshire, New York, Michigan, Minnesota, and Wisconsin. It may be noted in the Table 1 that these states have enacted laws specifically intended to ease the tax burden on the forest owners, mainly by taxing lightly until a harvest of products enables them to pay their just share.

Numerous states in which timber is a less important part of the economy or in which most of the forest land is government-owned have other forms of special tax laws originating in the theory that tax reductions are a force in furthering resource conservation. These states have made tree culture almost tax free or even profitable for the land owners. The names of the special laws in these states are exemption, bounty, fixed assessment, and differential assessment as described in the table.

Other states have passed tax laws for the specific purpose of obtaining revenue from forest products to aid in fire protection and in other conservation measures undertaken by the state governments. These laws are not listed in the summary.

It may be concluded from this brief analysis that the important factors in determining what forest tax law has been applied in each state are the condition of the forest properties, types of land ownership, and the other characteristics of the forest economies of each individual state.

[1]The author wishes to express his appreciation to Robert F. Keniston of Oregon State College under whose guidance this study was undertaken.

TABLE 1.—A SUMMARY OF FOREST TAXATION BY STATES

State	Type of law and date	Classification of land			Tax rates or assessments	
		Eligible land	Method	Required conditions	Timber	Land
Alabama	Yield 1923	Any suited to forest culture.	Owner applies for contract with state.	Nothing must hinder growth. Utilization under state rules.	Yield tax at 8 percent of value of timber cut.	Under 160 acres is exempt. Other, assessed as other property but on value of land alone.
Arizona	None					
Arkansas	None					
California	Exemption 1926	Any land not previously bearing merchantable timber or from which 70 percent of merchantable timber has been removed.	Action by assessor. Owner may request.	Timber is considered immature for 40 years after planting or cutting.	Exempt.	Subject to property tax.
Colorado	Exemption 1911	Planted land stocked with immature timber.	Action by assessor.	Must not be mature nor be more than 30 years of age.	Exempt.	Subject to property tax which must not be increased due to planting.
Connecticut	Exemption 1929	Land having a stand of trees.	Owner applies to state forester.	Stand of trees that will be valuable as lumber in future.	Exempt.	Taxed as other real property.
Connecticut	Yield 1913	5 acres or more. Land worth less than $25 per acre. Fully stocked with approved species.	Owner must apply to state forester.	No grazing. Must not be cleared for other use.	Over 10 years old:[1] 2 percent of value of cut during 1st 10 years. 1 percent increase every 10 years to 7 percent max. Under 10 years old:[2] 10 percent of value of cut.	Tax levy not to exceed 20 mills on full value at time of classification. Value includes timber under Class 1.
Delaware	Exemption 1931	5 acres or more. Sufficient trees under 5 feet in height to insure merchantable crop.	Owner must apply to State Forest Commission.	Protect from fire, grazing and other damage. Cut only trees marked by State Forestry Dept.	Exempt for 30 years.	Exempt for 30 years.
Florida	None					
Georgia	None					
Idaho	Yield 1929	Must be within a reforestation district. Chiefly valuable for forestry. Timber must be removed under regulation.	Owner must present a verified petition to Board of Forestry for contract.	Must be managed according to regulations	Yield tax at 12½ percent of stumpage value.	$1 per acre fixed assessment.
Idaho	Exemption 1937	Must be within a cooperative sustained yield district. Owner must be planning to cut.	Owner must file notice of intent to cut.	Filing of intent to cut makes owner subject to regulation in cutting.	Young growth and seed trees exempt.	Taxed as other real property.
Illinois	None					
Indiana	Fixed assessment 1921	3 acres or more. Land must be well stocked with approved species.	Owner must apply and pay for accurate survey.	Stand must be kept fully stocked. No grazing. Owner must make annual written report.	Fixed assessment of $1 per acre.	Fixed assessment includes land.

[1]Class 1. [2]Class 2.

TABLE 1.—*Continued.*

State	Type of law and date	Classification of land			Tax rates or assessments	
		Eligible land	Method	Required conditions	Timber	Land
Iowa	Fixed assessment 1906	2 acres or more. Must be not less than 200 trees of approved species on each acre.	Owner must apply.	Stand must be kept fully stocked. No grazing. Not more than 1/5 of the total number of trees may be cut in a single year.	Fixed assessment of $4 per acre.	Fixed assessment includes land.
Kentucky	None					
Kansas	Exemption 1941	One acre or more of approved shelterbelt or windbreak between 60 and 120 feet wide.	County commissioners determine each year what land is used for shelterbelt purposes under law.	Must be maintained in accordance with good farm forestry practice. No grazing.	Trees are exempt from taxation.	Certain of the lands are eligible for an 80 percent reduction in assessed value.
Louisiana	Yield 1910	Denuded land suited to the practice of forestry. Average actual value must be from $3 to $8 per acre.	Owner must apply for contract not to exceed 40 years.	Owner must plant suitable timber trees, protect from fire, and maintain thrifty growing conditions.	Yield tax at 6 percent of value of products cut.	Assessed at value which must average from $3 to $8 per acre.
Maine	Exemption 1872	Cleared land which has been planted with 640 forest trees per acre and cultivated for 3 years.	Owner must apply to the assessors.	Trees must remain thrifty during the 20 year exemption period.	Exempt for 20 years.	Exempt for 20 years.
Maryland	None					
Massachusetts	Yield 1914	At least 10 acres of forest land not used for grazing or purposes other than forest production. Worth $25 or less per acre.	Action of local assessors. Owner may refuse.	Used for forest production and not have a higher value for other use.	Yield tax in year of classification: 1 percent of stumpage. 1st year after—2 percent. 2nd year after—3 percent. 3rd year after—4 percent. 4th year after—5 percent. 5th year after—6 percent.	Assessment in year of classification and 1st year after —75 percent of value of land and timber. 2nd and 3rd years after—50 percent of value. 4th and 5th years after — 25 percent of value. None of these adjusted values must be less the $5 per acre.
Michigan	Yield 1914 (woodlot)	Land must be a part of an agricultural tract of not over 160 acres, but must be less than ¼ of it. Desirable species.	Owner applies to county treasurer.	Maintain full stocking. Grazing by permission.	Timber is taxed at 5 percent of stumpage value when cut.	Land and timber assessed annually at $1 or less per acre.
Michigan	Yield 1925 (Commercial)	Land must be capable of producing commercial timber. Must not contain natural resources other than timber.	Owner applies to Dept. of Conservation.	Nothing must hinder timber growth. Need permit to cut.	Yield tax at 2 percent of stumpage when cut, increasing 1 percent each year after classification to a maximum of 10 percent.	Specific tax of 5 cents per acre.
Minnesota	Yield 1927	35 acres or more suitable for commercial forestry. 5 to 40 acres also if owner or tenant lives thereon.	Owner applies to county board. Contract with state up to 50 years.	Must be maintained according to contract.	Yield tax on cut made in 1st year of classification is 40 percent of stumpage. Tax is reduced 2 percent annually until 10 percent. Exempt if merchantable at time of contract.	Specific tax of 6 cents per acre.
Minnesota	Bounty 1871	1 or more planted acres.	State pays $2.50 per acre for 6 successive yrs. (not to exceed $25 in any one year)			

TABLE 1.—*Continued.*

State	Type of law and date	Classification of land			Tax rates or assessments	
		Eligible land	Method	Required conditions	Timber	Land
Mississippi	Yield 1940	All timber is subject to this tax.	Non-optional		All growing timber is exempt from ad valorem taxes. Products are taxed when cut at set rates per unit.	Property taxes apply to value of land only.
Missouri	Yield 1946	At least 40 acres not valued at more than $10 per acre without timber.	Owner applies to district forester for 25 years of classification.	Proper forest conditions and practices must be maintained. Grazing with permission.	Yield tax on cut made 1 to 10 years after classification is 4 percent of stumpage. 11 to 20 years is 5 percent, 21 to 25 years is 6 percent.	Assessed at $1 per acre.
Montana	None					
Nebraska	None					
Nevada	None					
New Hampshire	Yield 1950	All timber land.	Non-optional	Owner or operator must give notice of intent to cut. Mature timber must be cut or will be taxed at ad valorem.	Yield tax at 10 percent of stumpage value. Owner may apply for 30 percent abatement of tax for good practices.	Ad valorem tax on land value only.
New Jersey	None					
New Mexico	None					
New York	Yield 1912	15 acres or more of forest land; planted, partially cut, or within 3 years of maturity.	Owner applies to assessors and Conservation Dept.	Thinnings with permission. Forests must be kept below certain volumes per acre by good cutting practices.	Yield tax at 6 percent of stumpage value.	Assessed a value in common with other lands and not more than at time of classification.
North Carolina	Exemption 1939	Trees planted for reforestation purposes.	Assessor takes action.	Maintain good Growing conditions for 10 years.	Planted trees are exempt for 10 years.	Assessed at value without regard to trees.
North Dakota	None					
Ohio	Differential assessment 1925	Any land bearing a stand of trees.	Owner applies to state forester.	Adequate stocking of valuable timber trees. No grazing. Must protect from fire.	See Rate—land →	Forest land may be taxed at 50 percent of local tax rate.
Oklahoma	None					
Oregon	Yield 1939	Suitable for forest crops but timber not presently mature in sufficient quantity.	State Board of Forestry determines what lands are eligible and may enter into contract with owner.	Protected and used primarily for forest production. Permit needed to cut and assurance of tax payment given.	Yield tax at 12½ percent of value before cutting.	Specific tax at 5 cents per acre, west of Cascade Summit. 2½ cents per acre east of Cascade Summit.
Pennsylvania	None					
Rhode Island	Exemption 1878	1 to 300 acres worth less than $25 per acre and planted to 500 specified trees per acre.	Owner must file affidavit with assessors.	Maintain good growing conditions for 15 years. Fire loss must be replaced.	Exempt from taxation for 15 years after planting.	Exempt for 15 years after planting.
South Carolina	None					

TABLE 1.—Continued.

State	Type of law and date	Classification of land			Tax rates or assessments	
		Eligible land	Method	Required conditions	Timber	Land
South Dakota	Bounty 1890	Land must be planted to 300 trees per acre.	Owner must apply to the county auditor.	Must maintain 170 trees per acre for 10 years.	State pays $5 per acre per year for not over 10 acres of each owner.	Ad valorem tax on land only.
Tennessee	None					
Texas	None					
Utah	None					
Vermont	None					
Virginia	None					
Washington	Deferred tax 1941	Forest land used chiefly for timber production and not classified under yield tax law. No woodlots under 40 acres.	Owner must give petition to county assessor.	Continued use for timber production	Assessed as other personal property when classified. Tax levy is diminished 7½ percent each year after classification until 75 percent reduction is reached. Deferred amount is payable when timber is cut.	Assessed as other personal property but as if timber had been removed.
Washington	Yield 1931	Immature or unforested lands chiefly valuable for timber production.	State Forestry Board must determine what lands eligible. Owner may enter into contract.	Land must be used for forest production and protected as law requires.	Products taxed at 1 percent of market value for each year of classification with maximum of 12½ percent.	Assessed at $1 per acre west of Cascades and 50 cents per acre east of Cascades.
West Virginia	Forestry amendment of 1946 makes a forest tax law possible but none has been enacted as yet.					
Wisconsin	Exemption 1935	Any fenced woodlot not more than 1/5 of the farm of which it is a part. Any slopes in excess of 30 percent.	Sworn statement by owner to the assessor is needed.	Protect from grazing, mowing cultivation and burning. Maintain forest conditions. Promote growth of grass, trees, or shrubs on slopes to prevent erosion.	Exempt.	Exempt.
Wisconsin	Yield 1927	40 acres or more capable of supporting merchantable timber. 50 percent of timber removed since 1915.	Owner must send petition to Conservation Commission stating intention of practicing forestry. Contract may be made for 50 years and is renewable.	Notice of intent to cut needed. Commission may limit cutting on any classified land, and inspects every 5 years. Must be kept open for hunting and fishing.	Taxed at 10 percent of stumpage value on private land and at 10 percent of half the stumpage value on county land.	Specific tax of 10 cents per acre. Management costs may be deducted under state income tax law. County land exempt.
Wyoming	None					

Forest Management on the Cedar River Watershed[1]

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USE AND DEVELOPMENT of the surface areas from which cities obtain their water supplies is of direct concern to the cities involved. The problems presented may be very complex. Often it is necessary to resolve several conflicting interests before a satisfactory solution can be evolved. The case of the City of Seattle has been no exception and the story of its water supply and the management of its watershed is one of considerable interest.

It was in the 1890's that Seattle, feeling that the water supply then being pumped from nearby Lake Washington was insufficient and unsatisfactory, took steps to develop a gravity system from Cedar River. The first water from Cedar River was delivered to the city in 1901. Since that time, this source has supplied all the city's water, and in recent years water for the city's environs as well, a population of over one-half million people.

The Cedar River has its source in the mountainous region forming the crest of the Cascade Range in central western Washington. Here the streams are swift flowing, many in narrow, steep sloped valleys, the summits of whose flanking ridges rise to elevations of 5,000 feet above sea level. Some 13 miles from its source, the flow of Cedar River is checked by the waters of Cedar Lake, a large natural lake 4½ miles long by ½ mile wide which completely occupies the valley floor.

Leaving Cedar Lake, the river makes a rapid descent of 600 feet in the next 2 miles, forming Cedar Falls. Below the falls the river valley broadens out, with gentle to moderate slopes some bench land, and a gradual drop in elevation to Landsburg, at which point the intake is located. Landsburg is 520 feet in elevation and 23 miles from Seattle.

Through local custom and usage, as well as in the ordinances of the City of Seattle, the term "Cedar River Watershed" has come to denote all the Cedar River drainage above the intake. It extends eastward from Landsburg for an airline distance of 25 miles to the Cascade crest, with a maximum breadth of 8 miles and has an area of 143 square miles, or 91,500 acres.

The eastern portion of the watershed is entirely mountainous. Rock outeroppings are frequent, although it is only on a few of the higher peaks that there are extensive barren areas of rock, either cliffs or slides. The soil mantle, which has been formed by the weathering in place of the underlying rock, is composed of a top layer, the soil proper, consisting of fine material, sand, clay, and humus, varying in depth from a few inches to a foot or two, and a bottom layer, the subsoil, consisting in addition to the fine material, of coarser, angular rock fragments, of variable size. The bottom layer varies up to many feet in depth. On the whole, this soil mantle permits rapid percolation of water from the surface, providing an excellent media for underground water storage. It supports, or has supported, a heavy forest growth even to the summits of most of the mountain ridges.

The western portion of the watershed differs in character. Although surrounded on the north, east, and southeast by mountain ridges, the western portion of the watershed consists of rolling or bench lands. The coarse-grained igneous rock, characteristic of the eastern portion, gives way in the west to basalts and volcanic conglomerates which, in turn, are superseded by rocks of sedimentary origin, such as sandstone, shale, and clay. Deep soils have been formed by the weathering of these rocks and the bed rock is only infrequently exposed. Most of the area below 1600 feet elevation is overlain with a deep mantle of glacial drift. Large deposits of this drift across the throat of the Cedar River valley damned Cedar River and formed Cedar Lake. The glacial drift is a heterogeneous mixture of clay, sand, gravel, and boulders of all sizes, covered by a light soil mantle derived from the weathering of the glacial material below. The glacial deposit is a physiographic feature of great importance in this portion of the watershed. There is very little surface run-off from this area, as the deposit is quite porous and precipitation is rapidly absorbed and held as ground water to reappear again as springs along Cedar River. Many of the streams descending from the high slopes disappear underground on reaching this deposit and do not reach Cedar River as surface water.

The watershed lies in a region of moderate to heavy precipitation. At the Landsburg intake the average annual precipitation is 54 inches; eastward in the mountains, it increases to 104 inches at Cedar Lake. Most of the precipitation comes during the fall, winter, and spring months. A dry season, with only occasional rain, starts in June and extends into September. Storm periods with extended heavy precipitation sometimes occur during the rainy seasons, with resulting flood stages in the streams. During the winter months much of the precipitation falling at the higher elevations is in the form of snow which gradually accumulates, to form a hard and well packed layer of snow and ice, several feet in depth. The slow melting of this snow pack during spring and summer is important in sustaining stream flow well into the summer.

[1]Paper presented at the annual meeting, Society of American Foresters, Seattle, Wash. Oct. 13, 1949.

Early History of the Watershed

The Cedar River Watershed was not an untouched wilderness at the time the city entered the scene. Although it was covered by a dense and continuous forest from the lowlands to the summit, some settlement and industrial development was under way. A score or so of hardy individuals had taken up homesteads, timber or mining claims, built their cabins, and started to clearing land farms in this area, which, on the whole, is entirely unsuited for agriculture. Timber harvesting had also started and at Barneston some 6 miles above the intake, a sawmill community of several hundred persons was established. The coal and clay deposits in the northwest corner of the watershed were being developed, with a coal mine and a brick and tile plant in operation at Taylor. Branch lines of two common-carrier railroads had been constructed to serve these industrial communities. The land and timber ownership was vested in a wide variety of interests, from the homesteads and timber claims to large timberland owners. The lands in public ownership were held by the State of Washington as school lands, and by the U. S. Forest Service, since a portion of the Cedar River Watershed lies within the boundaries of the Snoqualmie National Forest.

At an early date the city started acquiring the lands within the watershed. The initial purchases of land bordered on Cedar River between Landsburg and Cedar Lake, and areas surrounding Cedar Lake, including the power rights at Cedar Falls. Later it was deemed desirable to acquire all lands within the drainage basin. From 1910 to 1914 extensive acreage was acquired. Since that time, at every favorable opportunity, additional acquisitions have been made, so that at the present time the city owns a total of 62,700 acres within the watershed. Most of the remaining 4,300 acres of privately owned land is under contracts stipulating its conveyance to the city as rapidly as the mature timber is cut. The state lands have been acquired by the city. A land exchange between the U. S. Forest Service and the city has been worked out, whereby the city is exchanging timberlands, which it has acquired outside the watershed, for the 24,500 acres of national forest lands within the watershed, after the mature timber on these lands has been cut. The initial exchange under this plan is now being processed. With the carrying out of the present plans, the city will in time become sole owner of the watershed.

With ownership of the land, the city has acquired control of the use of the watershed. The sawmill community of Barneston has long since cut the timber available to it, and no longer exists. Recently the city has completed the acquisition of the coal mine and brick and tile factory at Taylor. The railroads which served these communities have been discontinued and their roadbeds have been made into protection roads. Access to the watershed is restricted and is by permit only. The general public is excluded and recreational use in any form is not allowed. Sanitary patrol and regulation is maintained by the Water Department under direction of its sanitary engineer. Forms of use now existing on the watershed, in addition to water supply, are timber production, power production, and railroad use.

The excellent power site existing in the storage capacity of Cedar Lake, coupled with the 600-foot drop in Cedar River immediately below the lake, has been developed by the city into the Cedar Falls hydroelectric plant. This plant was the genesis of the present municipal light and power system. Now greatly overshadowed by the Skagit River development, it is still an important part of the system. The rated capacity of the plant is 30,000 kilowatt hours.

The transcontinental line of the Chicago, Milwaukee, St. Paul and Pacific Railroad Company runs through the watershed along Cedar River between Landsburg and Cedar Falls. In 1906 when the question of the city's granting right-of-way to the railroad was under consideration, it was decided that the water supply would not be adversely affected by the operation of the railroad. However, this has not been entirely true and some sanitary hazard, as well as fire hazard exists, because of this form of watershed use. However, under close cooperation with the railroad and its employees in enforcing use regulations, the hazard has been minimized.

Some watershed lands were logged prior to acquisition by the city. With most of the timbered land, the city pursued the policy of acquiring the land only; the timber and the right to cut it being retained by the former owners. To have purchased the timber would have required an outlay of several million dollars, an extremely heavy, if not impossible, financial burden for the city to carry. In making timber reservation agreements, it was possible for the city to write into these contracts such stipulations and restrictive clauses as the city deemed necessary to govern the logging operations of the timber owners so as to protect the purity and quality of the water supply.

In the vicinity of Cedar Lake, however, the city did purchase some 8,000 acres of timber as well as the land. In 1917 this timber was sold under contract, to be logged concurrently with adjoining timber, under various ownerships. Revenue from the sales of this timber has amounted, in round figures to $935,000, nearly enough to cover the original cost of the watershed (one million dollars). At the conclusion of this logging contract in 1940 there still remained 2,500 acres of city-owned timber. By the time this timber is cut, the city will have received more than enough revenue from its sale to cover completely the original cost of the watershed.

Logging operations were already in progress at the time the city began developing its water system, almost 50 years ago, and have been continuously in operation ever since. There was a period when as many as four different com-

panies were cutting timber concurrently in different localities on the watershed, with a combined cut of over 100 million board feet annually. Logging methods throughout all these years have been the same as those found generally in use at the same time throughout the Douglas-fir region, progressing from the ground yarding systems with their pole and skid roads of the early days up through the highlead systems, with steam-powered yarders, slack lines, and skidders of the railroad logging days, to the present truck logging era, with its versatile and flexible gas- and diesel-powered machines and tractors, capable of making operable most of the hitherto inaccessible stands of the mountain country.

Cutting methods have likewise followed quite closely the pattern generally found in use throughout the Douglas-fir region. This has been clearcutting, and with each succeeding year the cutting front has been extended, working from the more accessible lowlands toward the mountains, then working into the valleys and finally rising higher on the mountain slopes. The result has been an extensive, continuous, and ever-increasing area of cutover land.

Cutting practices on the timber sales of U. S. Forest Service, have evolved from clearcutting, first with regularly spaced seed trees, then with seed trees left in groups, then with no seed trees, and finally, to clearcutting of limited size on an area selection basis.

Immediately following logging and subsequent slash disposal, natural reforestation became operative, which by now, has resulted in the establishment on the cutover lands of a continuous second-growth forest many thousands of acres in extent. It varies in age from tiny seedlings to 40- to 50-year-old forests. Failure of this natural process to establish new forests has occurred only on areas minor in extent. These failures can be attributed to two causes: repeated burning by forest fires in the days before the watershed was given adequate fire protection, or on some of the mountainous area, particularly those with south or southwest exposures, to adverse site conditions which hinder and retard the establishment of reproduction.

Forest Management Program

Since 1924, the city has had a definite program of forest management for its lands, with a trained forester in charge. The watershed is large enough to be operated as a unit, and so can support its own staff for fire protection, reforestation, and other forestry activities. Fire protection is a very essential part of the management program and a fire protection system has been developed which has been successful in keeping losses very low. All activities within the watershed are handled to reduce the probability of fire.

Two lookout stations have been constructed on summits of centrally located peaks. During the summer months a fire-suppression camp is maintained at Walsh Lake in the western portion of the watershed. This camp also serves, throughout the year, as headquarters for all forestry work. A full complement of fire-fighting tools and equipment, sufficient for a crew of 75 fire fighters is maintained.

Fire losses have been held to a minimum. During the past five years there have been a total of 19 fires, burning a total of 60 acres. Close cooperation in fire protection activities is maintained between the Washington State Division of Forestry, which protects the area surrounding the lower portion of the watershed, and the U. S. Forest Service, whose lands are intermingled with the city's in the portion of the watershed inside the Snoqualmie National Forest.

An extensive system of roads is being constructed by the city for fire protection. Besides making all parts of the watershed easily accessible in case of fire, these roads aid in the sanitary patrol of the watershed, and where needed, are used in the transportation of timber products. Permanent fences and firelines are being constructed on the more accessible portions of the watershed boundary. Snags, left standing by the early logging operators, have been cut on areas totaling several thousand acres. All snags on the areas now being currently logged are cut by the operators as a part of the logging operations.

Areas, which, prior to 1924, had been swept by extensive fires, have been reforested by planting. Trees for this purpose have been grown in the department's own nursery at Walsh Lake. Some 5,068 acres have been planted. Future operations contemplate the planting of 1500 acres, recently acquired by the city, and which were severely burned several years ago. Some planting may be done on the currently logged areas, where site conditions are unfavorable for natural reforestation, and on such areas as may be burned in the future.

Under this program of fire protection and reforestation the cutovers are being covered with a second-growth forest, giving ample protection to the watershed area, just as satisfactory or perhaps even better than the original virgin forest.

The second-growth forest is predominantly Douglas-fir with lesser amounts of western hemlock, western redcedar, and true firs in mixture, much the same as the virgin forest preceding it. As elevations increase, the proportion of western hemlock, Pacific silver fir, and noble fir also increase and finally take over from Douglas-fir. Some of the lowland areas, particularly along streams, and on the moist sites, have reforested to hardwood growth, principally red alder. This tree is objectionable on a water-supply stream, because of the heavy autumnal dropping of leaves into the streams, and also because of tent caterpillar infestations, with the caterpillars likewise dropping into the water. The problem here is one of encouraging coniferous reforestation, and this is no easy task, for the alder is a prolific annual seeder. It becomes easily established, and grows very rapidly in its early years. Some alder stands, 35 to 40 years old, are attaining merchantable size

and will be harvested in the next few years. On these areas, a coniferous forest will be reestablished. On some areas where alder has been found in mixture with Douglas-fir, cedar, and hemlock, cleanings have been made, removing the alder and allowing the partially suppressed conifers to take over. Some 1,030 acres have been so treated.

All logging in the watershed is now being done under the Cedar River logging agreement, which is a contract executed in 1945 between the city and the four private timber owners concerned. It provides for the orderly harvesting, over a 40-year period, of the remaining virgin timber. At the time this contract was under consideration, and for some time prior, there had existed in Seattle, a divergence of opinion as to the advisability of continuing logging operations within the watershed, because of the possible damage to the water supply. The city had a careful study made to determine what effect, if any, continued logging would have on the quality, quantity, and purity of Cedar River water. The Cedar River Watershed Commission, consisting of two sanitary engineers and one forester, was employed to make this study. It was soon apparent, that the history of the watershed contained much of the answer to the problem; for, it had been in use some 43 years as a water supply, with timber cutting being practiced on it for almost half a century. During all this time the city had been accumulating much data on precipitation, streamflow, quality and purity of the water, and information on logging, reforestation, fire protection, and watershed use, all of which was made available to the commission. The commission concluded "logging practices on the watershed in the past have had no important or discernible effect upon precipitation, runoff, and quality of water . . . . . have not produced appreciable erosion of the watershed . . . (and that) the controls required on the water supply for the protection of the consumer against potential or actual sanitary hazards will be required whether logging is or is not practiced in the future."

The report further stated "controlled watershed use, rather than the maintenance of full virgin forest canopy, has advantageous values for water supply development. Such controlled watershed use has collateral timber production values, which are in no way incompatible with the watershed use for water supply development," and further stated "a program of sustained yield logging is recommended for future use on the watershed."

There are many provisions to the Cedar River logging agreement. It applies over all parts of the watershed, whether the operator is cutting his own timber, other privately owned timber, U. S. timber, or city timber. However, sales of city timber can only be made with the approval of the City Council. U. S. Forest Service timber sales operate under federal timber sales contracts with which the city agreement is in harmony.

The average yearly cut is limited to 35 million board feet, with a provision for revision either upward or downward at 10-year intervals. This volume limitation, coupled with the 40-year term of the contract, has in effect placed the harvesting of timber in the Cedar River watershed upon a sustained yield basis. Some 40 years hence, when the cutting of virgin timber is nearing completion, there will be second-growth stands, now being grown by the city, which will be ready for harvest. The sustained annual yield which can be realized in the future under intensive management will be at least 40 million board feet.

The contract provides for adequate fire and sanitary regulations. Use of city-owned roads for the transportation of forest products is stipulated. Operators pay the city 60 cents per thousand board feet for all timber hauled over the roads. The revenue received offsets considerably the city's annual expenditures for fire protection and reforestation. The operators maintain and improve, where necessary, the city roads which they use, and construct all additional roads needed to remove the timber. The main truck roads are a heavy duty type, well ballasted with rock, and surfaced with gravel or crushed rock. These roads will be a permanent asset.

So far, the method of harvesting has been almost entirely clearcutting, with the cut areas taking the form of strips or blocks, interspersed with blocks of standing timber. Where needed, reserve seed areas are being left. On two recent U. S. Forest Service sales some tree selection cutting, over limited areas, has been done. The shape and extent of the clearcut areas is determined principally by the distance from a seed source, since natural seeding can be expected to reforest much of these clearcut areas. Past experience, on the extensive cutover areas of the watershed, indicates that distances of ½ mile or even more, in the direction of the seed dispersal winds, is not too great. It is to one of the paradoxes of nature that much credit should be given for effective natural reseeding: for it is the hot and dry east winds of the fall months, which, although they make the forest exceedingly dry and create a condition of extreme fire hazard, also cure and open the cones, releasing the seed into the air to be scattered by these strong winds, over extensive areas.

The rapidity with which natural reforestation takes place is extremely variable and is always dependent upon intermittent seed crops. Some areas have reforested satisfactorily within a year or two after logging. On other areas the process is more gradual. On still others with adverse conditions, satisfactory restocking does not take place until other vegetation has become established, thereby giving protection to the coniferous seedlings. An average reforestation period extends up to ten years for satisfactory stocking. This period can be shortened by planting, especially on adverse sites.

Slash has been burned on those areas requiring it as a fire pro-

tection measure, but on many areas where conditions were favorable, the slash has been left unburned in the interests of better watershed protection, quicker reforestation and maintenance of the soil fertility and site quality. The results, over the past 25 years indicate that these objectives have been achieved. In the future, relogging will largely obviate the need for slash burning.

Two logging operators are now working in the watershed. The Anacortes Veneer Company, Inc., is cutting only a minor portion of its output in the watershed. The entire cut of the Mountain Tree Farm Co., a joint operation of Soundview Pulp Co. and Weyerhaeuser Timber Co. is confined to the watersned. Logging methods vary between highlead yarding, and ground yarding with tractors and arches. Relogging is being practiced, wherby such material as tops, broken chunks, and small trees are all being removed for pulpwood or small logs for local sawmills. This means very close utilization. Logs are hauled by truck to reloading sites at Cedar Falls and Selleck for shipment by rail to tidewater. The length of haul varies up to 20 miles. Logging camps are being operated at the reloading sites, with the logging crews transported to and from the woods operations by crew trucks. Logging must operate on a seasonal basis, for the heavy snows at the higher elevations cause winter shut downs of three to four months. Consequently the allowable maximum cut of 35 million has not yet been realized. The average annual cut, over the past three years, has been 22½ million board feet, from areas averaging 368 acres per year.

In 1948 a salvage cutting of city-owned timber was made. Under a favorable market, all usable material found in snags, windfalls, and dead and dying, and defective timber located on an area of 850 acres in the western portion of the watershed was removed. The city received over $30,000 in stumpage for the material removed, plus such additional benefits as the improvement and construction of roads needed for transporting the material, cutting of snags, and the betterment of the second-growth forest covering much of this area. Some of the material was cut from trees left as defective by the loggers over 30 years ago.

There has been much history in this account of the Cedar River Watershed. Throughout these nearly 50 years, in addition to the water resource, which is the primary purpose of the watershed, controlled use of the timber resource has been developed. Seattle feels that this is wise management, for just as the watershed produces a continuous supply of water, so can it produce a continuous crop of timber which enters into the economy of the community, providing employment for many citizens, raw materials for the sawmill, plywood, and pulp and paper industries of the region, and a substantial source of revenue for the city.

Height Growth of Pine Seedlings

Average annual height growth of loblolly and shortleaf pine seedlings in the Crossett, Ark., area is 86 to 88 percent complete by July 4 and 93 to 96 percent complete by August 1.

This was determined by making weekly height measurements on 15 dominant pine seedlings during the 1948, 1949, and 1950 growing seasons. The young pine observed were from 3 to 9 feet tall at the beginning of the growing season. Average annual height growth was 2.3 feet in 1948, 2.5 feet in 1949, and 2.8 feet in 1950. Rainfall from March through July of 1948, 1949, and 1950 was 73 percent, 118 percent and 135 percent of normal, respectively. At Crossett, amount of rainfall does not appear to affect the length of the growing period as much as it affects the amount of height growth.

H. L. WILLISTON,
Southern Forest Experiment Station.

Merchandising Forestry in the Douglas-Fir Region[1]

W. D. Hagenstein

Forest Engineer, Forest Conservation Committee of Pacific Northwest Forest Industries, Portland, Oreg.

GOOD FORESTRY, which is good business, is the only kind in which any forest landowner can be interested. To attempt to interest him in any other kind is a distinct disservice to him and a gross misuse of the salesman's time and effort.

The three and one-quarter million acres of certified tree farms is a substantial merchandising record for less than 10 years of active forestry promotion among Douglas-fir region landowners by a handful of private foresters. To claim undue credit for interesting the owners in forest management would be a complete distortion of the facts. Forestry, like any other business, depends upon the interplay of economic forces. The past decade has seen arrival of the time, long predicted by the late E. T. Allen, when it pays to grow trees in the Douglas-fir region.

Many well-intentioned owners tried practicing some kind of forestry over 40 years ago, but little of it was successful. This was largely because of inadequate knowledge of forest protection and its general ineffectiveness. They were trying to do what was impossible in their day.

What "sold" present-day forest management to landowners was the first convincing proof, as recent as 1940, that forest properties could be adequately protected from fire. A simple insurance principle did the trick: if annual protection expenditures were commensurate with the values at stake, tree growing could be made to pay. Tree farm, as an industrial synonym for forest management, was applied to the first fruitful attempts at adequate forest protection.

This ended the forestry crusade in the Douglas-fir region and ushered in the new era of applied forestry. Forestry, as a religion, gave way to the business of forestry. Forestry merchandising became an important professional job. Instead of fervent crusaders standing on stumps shouting, "devastation," "cut-out-and-get-out," and other equally unfortunate and opprobrious terms, the new generation of foresters began fernhopping the cut-overs and immature stands. Field observations were compiled and business analyses of their timber-growing possibilities carefully charting necessary protection, artificial restocking, opportunities for fuller utilization, and how much these operations would cost were presented to landowners.

To illustrate how tree farming was merchandised, several case histories are given below.

Case 1.—A company which had completed liquidation of its property after a quarter of a century's operation was offered $2 an acre for its lands by a public agency. The owners thought this to be a rather good price, although no forest inventory had been made of their cut-overs. It was assumed that little more than land value remained.

An intensive examination revealed that because of better-than-average protection during its operating life, more than three-quarters of the property was adequately restocked. The growing stock, based upon replacement cost, was worth more than ten times what had been offered for it. More data were collected and after calculating cost of adequate protection, necessary artificial reforestation, and carrying charges, and applying these to site and stocking data, it was shown that the property would grow low-cost timber over the rotation indicated.

This property is now being maintained as a permanent investment under the administration of professional foresters, even though there will be no significant timber harvests for another 30 years.

Case 2.—A large investment in wood-using facilities indicated the need for adequate supplies of raw material, but the company showed little evidence of interest in forestry.

The promotion effort here began with an extensive examination of the company's recent cut-overs and current operating areas to see what utilization opportunities were being overlooked. It was found that more than a quarter of the economically available raw material was being left in the woods. This concern engaged actively in relogging shortly thereafter and recovered much of the unutilized material, thereby enhancing substantially its old-growth timber inventory.

The next step involved working out a sustained yield prospectus based on annual wood requirements, present ownership, age classes, and additional growing stock necessary. The next move was made by the company. It hired a forester to examine in detail its cut-overs and to acquire further land and growing stock.

Today this company employs three foresters. Its utilization is excellent, its acquisition program is nearly complete; but it still has further to go in protection. The promotion endeavor is still working on this part of it. When this has been achieved, the company can be safely interested in artificial restocking of some of its inadequately forested holdings.

The "sale" in this instance began in 1941 and is still in the process of being completed.

Case 3.—A small forest landowner read about tree farms in his local newspaper and sought advice on how to manage his property.

A simple plan of management was worked out. It recommended immediate liquidation of mature timber, merchantable snags, and windfalls; prelogging of understory hemlock in a 90-year old Douglas-fir stand for pulpwood; construction of a fire road on the exterior

[1] Paper given before the Western Forestry and Conservation Assoc. Portland, Oreg., Dec. 9, 1949.

boundaries of the 200-acre property; affiliation with the local private protection agency, and planting of a few bare spots.

A year later, 40 acres of seedlings and saplings on this tree farm was burned over by a land-clearing fire which originated on an adjacent property. In the planting season that followed, this tree farmer planted his burn with nursery-grown seedlings. Through sales of stumpage and forest products, the original investment in the property has been amortized in four years and present management continues to be profitable.

Here is a case of interest aroused through tree farm publicity. The only forestry "sold" was help on the ground in getting this landowner started.

Case 4.—A company with only a few years' supply of mature timber is frank in admitting that it is liquidating. There is nothing else it can do. When its timber is cut out, it will cease both logging and manufacturing operations.

It has been successfully interested in good cutting practices, adequate protection, good utilization, and in artificial reforesting its non-stocked lands. Its interest in forest management was created solely on the basis that in final liquidation it will have a very salable asset instead of a parcel of low-value land. Its property, upon completion of mature timber operations, will be of low hazard, will be well-stocked with a good spread of age classes, and will contain permanent roads for forest management.

This "sale" and many others like it render real service to landowners and their communities, for it leaves tens of thousands of acres in good condition for combining with other holdings for the attainment of eventual sustained yield.

The merchandising of forestry cannot follow any rigid rules or specifications, for no two cases are alike. The only axiom that can be laid down is that "forestry as a business" can be "sold" and that forestry which is not good business should not be offered for "sale." The trees themselves must ultimately return their costs through consumer use with enough left over from their harvest and manufacture to compensate the timber grower for his time and effort and pay a little rent for the space occupied while growing on his land.

If there be any general formulae for "selling" a landowner his business opportunities in tree growing, they might be set down as follows:

(1) Dispel false notion that tree planting is forestry.

(2) Treat fire protection as an insurance risk with annual premiums invested therein commensurate with the values at stake.

(3) Demonstrate that all kinds of forest material other than big, prime, old-growth logs have value by showing a prospect any number of the several hundred profitable wood-using plants whose diet today is principally logs less than 20 inches in diameter.

(4) Use the "bookkeeping" approach by setting up an accounting statement of the rates of return from investment in trees which shows their increase for the first 50 to 80 years of their life at an increasing rate of interest and compare with returns from other investments.

(5) If the prospect is a wood user, calculate the cost of raw material from timber grown by himself as compared with the rising trend of stumpage prices on the open market.

(6) Bury once and for all the old fallacy that time required to bring a timber crop to maturity is too long by emphasizing properly instead that even though a harvest may not be reaped from each acre each year, *a growing forest does produce an annual crop of wood.*

(7) Plow out of any calculations for a timber growing prospectus the iniquitous and arithmetically absurd compound interest bogey with which all too many foresters have been guilty of proving that no one can afford to grow trees.

The case histories presented from the experiences of the writer and his colleagues demonstrate conclusively that there is no easy magic in promoting interest in forestry as a legitimate investment for venture capital. All that is required is faith in the land, adequate protection, conviction of the future value of trees yet to be grown or brought to merchantability, and an appreciation of the simple fact that no one can be converted to purposeful timber growing overnight.

Notes

Report On Forestry In Yugoslovia

The College of Forestry, University of Belgrad, Yugoslavia has published a *Bulletin of the Forestry College*, 1950, containing reports of forestry research written by staff members.

The College of Forestry developed from the Department of Forestry in the former Agriculture and Forestry College of Belgrad University.

An introduction written by Dr. Sinisa Stankovic (former professor of biology in the Agricultural and Forestry College in Belgrad) states that the publication brings together reports of the entire research work in forest science — a new achievement of Yugoslavian professional literature.

A paper by Professor Dusan Simeunovic outlines the planned reconstruction of forests in Yugoslavia. The entire forest area before the second world war was 19.5 millions of acres, but in reality 2.5 million acres of this area was waste land without forest cover. The forest management program before the war included yearly an area of 213,700 acres while an area of more than 12 millions of acres was not included. The average increment was very small, around 1.2 cubic yards per acre (in Germany it is twice, in Denmark three times as high). Now, the area where management must be introduced is seven times larger than before the war. The reforestation program, which showed an increase from 4,690 acres in 1927 to 8,027 acres in 1936 must, according to the new program, reach 49,400 acres yearly. Also a great increase is awaited in activity of saw mills and the paper industry.

The number of qualified professional personnel before the war was around 400 persons (most college educated) and must now be enlarged principally from the professional schools.

In the future about 5,000 persons (with high school education) must be available yearly for Yugoslavian forestry, according to the new program.

Dr. Jove Zubovic briefly describes the forest area in Serbia, and Professor Pavle Cerniavski discusses the problem of classification of Phytocesa (forest as a plant community).

Professor Branislav Jovanovic treats of the interesting problem of acclimatization of foreign trees. Particular attention is paid to the North America flora transplanted in the forests near Belgrad: *Thuja occidentalis, Juglans nigra, Prunus serotina, Juniperus virginiana, and Pinus strobus.*

A work of Svetislav Vasiljevic concerns the width of xylem rays on the certain species of the genus *Acer*. An article by Professor Branislav Jovanovich deals with observations of birch and conifers in relation to forest soil.

Professor Sveten Rosic gives results of research in control of soil erosion in mountain regions, Professor Dragolub Mirkovic presents his investigations in dendrometrical studies, and Assistant A. Urbanovski describes a method of increment calculation.

Professor Milutin Knezevic presents "Determination of the Position for Saw Mill on the Basis of Transportation Expenses," and Professor Mirko Milosavlievic's writes of the results of meteorological observations, which relate to the strong winter winds in this region of Europe, the so-called "Kashava."

Other papers in the bulletin, written by Professors Svetislav Zivoinovic, Konstantin Vasic, and Milos Maximovic concern investigations in forest entomology.

The entire bulletin reflects an efficient forest research program by the forestry college staff in Belgrad.

DIMITRI PRONIN,
Madison, Wis.

Status of German Language Forestry Periodicals

Some of the older readers of the JOURNAL OF FORESTRY and its antecedent *Forestry Quarterly* will recall that the German language forestry periodicals constituted an important and valuable source of technical information. While this was particularly true before World War I, these periodicals, for the most part, resumed publication after World War I even though shorn of some of their pristine glory. World War II dealt many of these periodicals a death blow — exceptions are the Swiss and Austrian periodicals — and, it is noted — those published in *Eastern* Germany. The *Western* German periodicals have, for the most part, "folded" or have dwindled to insignificance.

A recent check through the German language periodicals at the Yale Forest School library is significant. The Austrian publications are three in number. Extant is the *Allgemeine Forstzeitung* which appears bi-monthly in Vienna. Then there is a new periodical, *Oesterreich's Forst und Holzwirtschaft*, appearing twice a month. A third Austrian periodical, the time-honored *Zentralblatt fuer die gesamte Forst und Holzwirtschaft* has apparently "folded": Vol. 71, No. 1-2, September 12, 1949, was the last received at Yale. This periodical had a department called "Rundschau" which was a review of all forestry literature including English language references.

Within Germany itself, the most aggressive and ambitious publication is Dr. Heske's *Zeitschrift fuer Weltforstwirtschaft* (bearing the sub-titles "Journal of World Forestry" and "Revue Economique Forestiere Universelle") which is, apparently, the successor to the *Forstliche Rundschau* and contains much the same material. It is published in Hamburg.

Also from Western Germany is the *Allgemeine Forst und Jagdzeitung*. This century-and-a-quarter-

old periodical has suffered greatly in quality and quantity. It appears irregularly, monthly, at Frankfort A.M.; the publisher is J. D. Sauerlaender.

Berlin publishes several forestry periodicals. The most aggressive of these, *Forstwirtschaft — Holzwirtschaft*, appears semi-monthly. The latest issue at Yale was Vol. 3, No. 23/24 dated December 1949—it may have "folded" since then but not without a dutiful burst of glorification on Stalin's 70th birthday — a full page picture accompanied by fulsome praise used such extravagant terms as "Protector of our forests" and "Transformer of Nature" and stated flatly "only with Russia's help can all the German forests be reconstructed."

Paul Parey in Berlin still publishes the time-honored quarterly *Forstwissenschaftliches Centralblatt*. The latest volume 68, 1949 (at Yale) contains excellent reviews of foreign publications, including those in English language. Mention should be made of the *Holz-Centralblatt* (a newspaper of the forest industries) appearing at three-day intervals, which apparently "folded" after Vol. 76, No. 13, dated January 31, 1950. It was published at Suttgart.

Perhaps the *Forstarchiv* of Hannover has gone the same way: the latest number at Yale was Vol. 21, No. 1-3, dated March 31, 1950. The articles are largely on silviculture. After a five-year interim, this publication had apparently resumed on a quarterly basis under new editorship but its continuance seems dubious.

Among the definite "casualties" in Berlin is the ancient *Zeitschrift fuer das gesamte Forstwesen* which "folded" after a very meagre Vol. 76, No. 7/9 July/September 1944, and *Intersylva* which called itself the *Zeitschrift der Internationalen Forstzentrale*. Last copy, Vol. 4, No. 3, appeared in October of the year 1944 and had German and French editions. It showed the ambitious new buildings, projected in 1942, as headquarters for international forestry. *Intersylva* contained a department called "Mitteilungen: Silvae Orbis."

The excellent Swiss periodical: *Schweizeriche Zeitschift fuer Forstwesen* continues its second century of high quality. It is far and above the best of all the German language forestry periodicals.

A final note of interest (*Forstarchiv* for March 1950) concerns the forest schools still functioning in Germany; these are: Berlin (Eberswalde), Bonn, Dresden (Tharandt), Freiburg-i-Br., Giessen, Goettingen, Hamburg, and Munich.

A. B. RECKNAGEL,
Deferiet, N. Y.

An Ancient and Original Transportation System for Logs in Southern Alabama

On a trip through southern Alabama ten years ago the writer was told of a system of transporting longleaf pine logs from woods to mill, that has never to my knowledge been used in any other forest region. This consisted of digging ditches or sluiceways, with timbered sides, down the courses of small streams and floating the logs down these sluiceways. The logs in very early days were often rolled by hand into the ditches.

In 1948, on again visiting this region, the remains of several of these old ditches were examined. These ditches were 4 feet wide, and from 3 to 4 feet deep, timbered on both sides with 1-inch lumber and flitches nailed inside 4-inch posts made of longleaf pine saplings. The cost of constructing these ditches was contracted for at $800 per mile with materials furnished. The total lumber consumption per mile of ditch would have been a little over 50,000 board feet. Since lumber could then be produced at about $10 per thousand this would make an approximate cost of $1,500 per mile for the flume.

The real saving was made in transportation costs. The logs were first rolled into the flume end to end and dogged together with short pieces of chain in a single line. Water for driving was obtained by dams creating storage reservoirs, or by brush dams that turned the water of the stream into the ditch. When the gates were opened the logs floated along until or unless the water ran ahead of them and they stranded. More water was then turned into the ditch, until the logs arrived at the mill. This is claimed to be the cheapest system of log transport ever invented. Once the works were completed it took practically no labor in driving.

The ditches were made possible by the topography and the gradient of the streams used for transport. The maximum elevations in this region are only a few hundred feet. The profile of any stream with sufficient water to flush the flume was almost flat for its entire course, varying from 1 to 10 feet per mile; thus insuring an even flow of water throughout its length.

The ditch transportation began 70 to 80 years ago. The longleaf pine logs were cut and hauled to the ditches by ox teams, 5 yokes to the team. The drive usually consisted of about 200 logs of average lengths of about 30 to 35 feet. The only time a log was cut in two was when it was too crooked to be put in the ditch. All the logs were practically straight. The logs represented but one cut per tree. No defective timber was taken, and no limby or knotty portions. The waste in the tops would be very high by present standards. Since the logs must float, only mature timber composed mostly of heartwood was logged. This made the cutting highly selective, and left a large nucleus of small and defective trees, that furnished a second later logging job. Not all the logs had to be floated, since the high-floating logs could push the heavier logs downstream, but such logs were avoided as far as possible.

The first recorded instance of the use of this method of log transport was in Santa Rosa County, Florida, lying just south of Alabama, about 1873, by a man named Wallace. The logs were scaled for cubic contents, at the small end, hence were cut in lengths to give the maximum scale and were seldom over 50 feet long. They averaged about 24 inches in diameter at the small end. After the virgin timber was cut, the ditches were still used

to float smaller timber until about 1904, when railroads were substituted for log haul, largely because of increasing distances and inaccessibility. But for a time, on the operation above Brewton, Ala., a railroad was used to bring logs to a storage reservoir, from which they were floated 20 miles to Brewton.

Timber during this period was purchased from settlers for a maximum price of $1 per thousand feet, Doyle scale. The largest longleaf pine in this region was said to have measured 5 feet 2 inches on the stump. The average size was under 3 feet.

An old record states that the Blacksher Brothers in this territory, about 1880, gave for each 40 acres of timber three sacks of corn, three sides of bacon, a 10-pound caddy of tobacco, one barrel of flour, and 40 pounds of coffee. In some cases when the timber was very good, they threw in an extra sack of corn and 10 pounds more of tobacco. The purchase price of these commodities averaged about $28 per forty.

In this old operation the timber was first floated to a mill on Juniper Creek, erected in 1879. It was there cut into square timber and floated down another ditch in Burnt Corn Creek, to Brewton, where it was rafted and carried down Burnt Corn Creek into Conecuh River, thence to Ferry Pass, Fla., which was then the timber market for Pensacola. Cheap transportation alone made possible a profit for operations near Brewton. The timber cut in these early days was practically all exported and between 1880 and 1905 was carried to the port by water. In Italy, which was a large consumer of longleaf pine, the timber from Pensacola was said to have been rated highest in quality.

One local story, of undoubted veracity, concerned the construction of these ditches. Moccasins were plentiful and sluggish, seemingly quite indifferent to the presence of men. Two brothers were working on the ditch. One was a Methodist preacher on Sundays, the other was a Baptist, also a preacher. They got into a vehement argument over some religious difference, and in the heat of it, both sat down at the same time and continued their discussion. After an interval the foreman sauntered by, stopped, and casually remarked, "Seems to me you fellers ought to give that snake a chance." It seems that the Methodist had sat down on the head of a large moccasin, while at the same time, the Baptist had in like manner pinned down its tail. The writhing of the snake had not disturbed the contestants, who hastily leaped to their feet, and forgot all about the subject of their argument. The authority for that story is Alfred Warr of Brewton, Ala.

In recent years the railroad has followed the ditch into oblivion, and logs now roll by truck from stump to mill, while stumpage prices are no longer $28 per forty, or even $1 per thousand. Young longleaf pines from seedlings to sawlog size cover much of the territory logged 50 years ago, and such firms as T. R. Miller Company of Brewton, Ala., and Alger Smith Company of Century, Fla., are definitely planning on a perpetual cut of this valuable species of pine, under approved forestry practices.

H. H. CHAPMAN.

International Society of Tropical Foresters

In Washington, D. C., on December 14th, 1950 twenty-four foresters met to form the International Society of Tropical Foresters.

The primary purpose of the new organization is to keep tropical foresters in touch with others in their field and with the work they are doing. It will also serve as a clearing house of information on developments and opportunities in tropical forestry, as well as on recent additions to tropical forestry literature. It will be a repository of information on the location and fields of activity of men working in tropical forests or with tropical forest products. It is planned to keep the membership in touch with developments by means of occasional memoranda or news letters. In this way the organization should facilitate contact between occupational opportunities and qualified foresters.

Membership in the society is open to foresters of all nationalities working in all types of tropical forest products, including rubber. No dues are required, and those interested are urged to write Tom Gill, 1214 16th Street, N. W., Washington 6, D. C.

Foresters present at the organizing meeting were: James S. Bethel, J. Willcox Brown, John R. Camp, H. H. Chapman, Hugh M. Curran, Harvey R. Frantz, Juan B. Gaztambide, Tom Gill, Robert W. Hess, Ralph S. Hosmer, LeRoy W. Huntington, Seth Jackson, Henry S. Kernan, Robert F. Knoth, Elbert L. Little, Jr., C. B. Manifold, K. R. Mayer, Richard A. Morin, Barrington Moore, Arthur F. Muschler, G. P. Spangler, G. R. Trimble, Jr., Marshall R. Turner, Frederick H. Vogel, George F. Walker, and J. J. Zirkle, Jr.

We Present

Bror L. Grondal
Forest Products Specialist

When older graduates of the University of Washington's College of Forestry return from far places to visit their Alma Mater, they make a beeline for Room 209 in the Forest Products Laboratory. The "came to see Bror," the man who taught them dendrology, wood preservation, utilization, wood technology, and a half-dozen other subjects, although in some cases he was their junior by several years.

They remember his emphatic, practical lectures and laboratory sessions, as well as the sympathetic advice he gave them when they came with personal problems. If their trouble was financial, he often lent them money or endorsed their loans.

Reckoning a college generation as four years, Dr. Bror Grondal has imparted his academic and practical knowledge to ten generations of foresters who now head other forestry schools, manage wood-utilizing industries, or serve in other vital capacities wherever forest products are grown or used.

In the days when Washington's entire forestry enrollment was less than its present senior class, and when no student celebration was complete without Bror Grondal's "chaperonage," he was the only University of Washington faculty member, other than the President, who appeared regularly in *Who's Who In America*. He still does, but with a much longer list of accomplishments.

Enumeration of his honors and memberships would be too space-consuming for inclusion in a brief sketch, but a few at random are life membership in the Swedish Society of Foresters, past national presidency of Xi Sigma Pi, first presidency of National Forest Products Research Society, and recent choice as honor alumnus of the University of Washington forestry graduates.

Dr. Grondal's intimate knowledge of wood structure and values is used extensively in litigation, and as a basis for evaluating transmission lines, decks and wood structures in general. The record of his appearances in court as an expert witness in both civil and criminal actions would fill a large and tremendously interesting book. Attorneys throughout the Pacific

BROR L. GRONDAL

Northwest have come to respect and accept his statements, and to choose their words very carefully when they cross-examine him—or better yet to let his testimony stand unchallenged.

Whether or not complete subservience to established dogma is considered a desirable quality, it's quite lacking in Bror Grondal's character. He despises hypocrisy and the small dishonesties that sometimes creep into business and professional procedure. His friends know and admire his intolerance of anything less than complete truth and accuracy, and the fact that his well-based opinions are inalterable.

An arduous but interesting chore for a research expert or statistician would be an estimation of the added values produced by Northwest forest industries as a direct result of Grondal's knowledge and advice. For many years he has been chief consultant of Moore Dry Kiln Company, Red Cedar Shingle Bureau, and several other commercial firms and associations. Many processes now extensively employed were patented by him and assigned to the University of Washington for public use.

Grondal's ability as a writer has resulted in years of uncredited effort as "faculty adviser" to the Forest Club *Quarterly* and other student publications, which usually means editing or complete rewriting. His own list of professional publications, headed by the only authoritative book ever written on wood shingles, will total an even hundred as soon as he finds time to write just one more.

Bror Leonard Grondal was born at Round Rock, Texas, May 15, 1889. When he went to the University of Washington for his master of forestry degree in 1911, after taking his A.B. degree at Bethany College, he was strictly on his own. He worked in the university library and lived in a basement room under the huge natural-log Forestry Building, used as a museum but originally built for the Alaska-Yukon-Pacific Exposition. No student on the campus could match his ability in locating restaurants that served the largest quantity of food at the lowest price. Fifteen cents was par, although he might squander two bits for a Sunday dinner.

Bethany College awarded him the degree of doctor of science in 1943.

No outsider should attempt to confer with Dr. Grondal on a "school" day, unless he's willing to stand in a waiting line of graduate students and upper-classmen. The best time to catch the professor alone in his office or laboratory is on a Sunday, an official holiday, or on any day between midnight and 2 a.m. Look for a lighted window in the Forest Products Laboratory on the University of Washington campus, and you'll know that you've caught Dr. Grondal while he's really at work.

DONALD H. CLARK.

Reviews

Practical Grassland Management.

By B. W. Allred. 307 pp. Illus. Sheep and Goat Raiser Magazine, San Angelo, Texas. 1950. $5.

This book aims to give the rancher and farmer a practical philosophy and a working knowledge of grass. It is a natural outgrowth of the sweeping upsurge of interest in grassland conditions and management during the past twenty years. The origin of the book in Texas is especially appropriate, for it climaxes a decade of activity in range education, extension, research, and management by both public and private agencies in the Southwest.

The book has 15 chapters, the first three of which deal with the importance of grass, how grasses grow, and the relationship of grass to the soil. The next 8 chapters consider specific examples of major ecological and economic grass groups: first, important cultivated grasses; then the various types of range grasses, including tall and short warm season grasses, cool season species, specialty grasses, grasses injurious to livestock, and forbs associated with grasses. Then come chapters on livestock grazing habits, grassland conservation, and the use of stock salt and water.

The final chapter on ranch planning ties the whole subject together for soil, water, and grass conservation, with especial emphasis on range condition. Appendix material includes grass seeding recommendations, plant names, a classified list of selected references, a glossary of range conservation terms, and index.

The book is written to be read. It is packed with authenticated facts, illustrations, and convincing case examples. Four paintings, three by Remington and one by Russell, lend considerable rancher interest.

If this were intended as a technical textbook in range management, one could criticize extraneous and omitted text matter or quibble over i-dots and t-crosses. But this reviewer prefers to look at it in broader fashion—as a first effort in book form to enlighten ranchers about producing and using grass as a living, growing resource—and it's a good job. Even forest range managers would benefit by studying both the educational approach used and the factual matter presented.

ROBERT S. CAMPBELL,
Southern Forest Experiment Station.

The Economics of Pulp and Paper.

By John A. Guthrie. 205 pp. State College of Washington, Pullman, Wash. 1950. Paper bound, $1.50; cloth, $2.50.

This study examines all important aspects of the economics of pulp and paper. Its purpose is twofold: to assemble and analyze the available economic data pertaining to this industry and to appraise its particular problems and trends.

In order to provide a clear understanding of current problems, the book traces the development of the industry. It presents data on the volume and location of pulpwood supplies, discusses the factors influencing the location of the industry, and describes the manufacturing processes. Attention is focused on the necessity for augmenting our diminishing timber resources through conservation and research.

The author makes a detailed analysis of the trends in consumption and production and predicts future consumption of all important grades of paper. Problems and impending developments in international trade, marketing, transportation, price policy, and labor relations are dealt with. In addition, he makes an objective appraisal of such controversial subjects as the tariff, attempts at price restriction, and the recent basing point decision.

This study provides a comprehensive treatment of regional differences in costs of producing pulp and paper. Special attention is devoted to the cost and profit outlook for the industry.

Dr. John A. Guthrie is professor of economics and director of the Bureau of Economic and Business Research of the State College of Washington. In 1941, his book *The Newsprint Paper Industry* was published by the Harvard University Press.

Forestry at Cornell — 1898-1948.

By Ralph Sheldon Hosmer. 64 pp. Illus. College of Agriculture, Cornell University, Ithaca, N. Y. 1950.

This limited edition of the chronology of the "old college of forestry" and the "new school" is available only to practicing Cornell forestry graduates. It tells why the schools were established, what contributions they made, and why they were discontinued. It tells also about the teaching and extension staffs, student bodies, curriculum, educational equipment, school forests, research, and publications.

The first school of collegiate rank continent to teach technical forestry, the New York State College of Forestry at Cornell University, was begun by Dr. Bernhard E. Fernow in 1898. He was director until 1903, when political pressure undermined the school's support. Difficulty arose from Dr. Fernow's rather severe cutting practices on the school forest at Axton, N. Y. One hundred fourteen men received instruction under Dr. Fernow. The curriculum long guided other forestry schools.

The Department of Forestry of the New York State College of Agriculture operated from 1910 to

1948 when it merged with the Cornell Department of Conservation. Walter Mulford, an "old school" graduate, was in charge until 1914. Ralph S. Hosmer was head until his retirement in 1942. Among others, he was assisted by Professors Bentley, Spring, Recknagel, and Guise. The close working relationship of these five men for nearly twenty years fostered a strong esprit de corps which has been maintained ever since by the 378 graduates of the school.

Professional training ended in 1938 because state authorities decided that two state supported forestry schools, Cornell and Syracuse, should not be maintained. An investigation of forestry activities in the two schools by Dr. Harlan Hoyt Horner brought out that the change was recommended solely to prevent duplication of effort, and that it was better to continue the larger unit at Syracuse. There was no failure of the Cornell unit to operate effectively or economically, or of Cornell University to meet its obligations.

In 1932 Dr. Horner admitted frankly the state made a mistake in 1903, although he stated it was too late to remedy that error, in spite of the fact that the faculty had served with singular devotion, rendering conspicuous professional service over a long period.

Bristow Adams, who taught a nonprofessional course on conservation at Cornell for many years, said this about the change. "'Old School' and 'New School' have passed . . . but the sincerity and seriousness with which all of Cornell's work in forestry has been done leaves an indelible stamp on the future. And there, after all, is the real reward. Its light was worthy because it was kindled with enthusiasm and kept aflame by a spirit of unselfish service. Looking back, there is a task accomplished; looking ahead, one sees many generations building upon the foundation laid at Cornell, and keeping green the memory of the school and of those who made it great."

Copies of the chronology have been distributed to the libraries of all schools of forestry in the United States and Canada.

Cornell foresters everywhere keenly regret the school's passing, but just as keenly are glad that they had the privilege of attending.

SETH JACKSON,
U. S. Forest Service

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Proceedings of the United Nations Scientific Conference on the Conservation and Utilization of Resources.

Vol. 1, Plenary meetings. 431 pp. Columbia University Press, New York. 1950. $4.50.

The U. N. conference proceedings of which this book is the first of eight volumes was held during the period of August 17-September 6, 1949 at Lake Success, N. Y.

While Mr. Pinchot was still living he proposed an international conference on world resources to President Roosevelt. In 1946 a conference on natural resources was recommended by President Truman to the U. S. representative on the U. N. Economic and Social Council. For various reasons the conference could not be held until three years later, but when it was called it brought together some 700 scientists and resource specialists from 50 nations. More than 500 papers were presented.

There were 18 plenary and 54 technical section meetings held during the conference. Simultaneous interpretation facilities were provided in English and French for all meetings, and in Spanish also for certain others. For most participants the sessions were chiefly valuable for the opportunities afforded for workers the world over to become personally acquainted with colleagues in their special fields.

In the plenary sessions, with which this first volume is concerned, the situation with respect to world resources was discussed in rather broad terms. These papers, one of which was contributed by Fairfield Osborn, dealt largely with fundamentals and were principally nontechnical. For example, the session devoted to a world review of critical resources contains a comprehensive paper on forests by Marcel Leloup of F.A.O.'s Forestry and Forest Products Division. The session on soils and forests had papers by H. H. Bennett of the Soil Conservation Service and by J. D. B. Harrison of the forestry staff of F.A.O.

One of the interesting sessions is devoted to education for conservation. This chapter is significant, not for what it can teach conservation educators in America, but rather as an object lesson in the little extent to which even the most elementary conservation education is available the world over.

This conference opened, as it were, a new chapter in the development of the United Nations. Because the conference was scientific in nature and was not called for the purpose of taking action, the *Proceedings* are devoted largely to reports on existing conditions. However, now that a preliminary review of critical resources has been made, a next logical step would be a second conference under U. N. auspices in which appropriate action would be taken or at least recommended.

As a forum for discussion and for the presentation of information the United Nations Organization has demonstrated its worth. But it is in the realm of action that it will exist or die. American conservationists are all for action.

HENRY CLEPPER.

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Marketing Montana Christmas Trees.

By Ben M. Huey and S. Blair Hutchison. 24 pp. illus. School of Forestry, Montana State University, Missoula, Mont. 1950.

This publication is outstanding in supplying detailed information on the subject for a state. Profusely illustrated with photographs and attractive charts, it provides valuable data for any one studying the Christmas tree industry. One chart, which compares returns of Christmas trees with ponderosa pine sawlogs and Douglas-fir sawlogs, shows that Christmas trees

gave the best returns. Among the topics covered are production, marketing, and problems of forest management.

Under marketing, mention is made of the "waste" of trees and the acknowledgment is made that Christmas trees are a perishable commodity. Frequently trees that reach the markets are of such poor quality that they never should have been harvested in the first place. Often it is these low-quality trees or culls which we see left on the markets after Christmas. Obviously too, if only the best quality trees are harvested, eventually a stand of culls will be left for the future crop. But poor quality trees can be improved by pruning and shearing. However, if a future crop of pulpwood, sawlogs, or veneer logs is wanted good trees must be left for such crops. The publication suggests that a first step toward improving quality would be to introduce price differentials which take quality into account, encourage the growing of good trees, and discouraging the cutting of poor ones.

To accomplish "grading" will require a lot of education and follow-up among the Christmas tree cutters. Illustrations are submitted as guides to grading rules and these should be in the hands of every cutter. One operator who has made use of such photographs among his cutters reports it has helped tremendously in eliminating cull trees. Certainly one of the most important problems facing the industry is that of grading. Associations of growers should be encouraged.

Other states of high Christmas tree production might well make available similar publications about the 50-million dollar Christmas tree industry.

The Christmas Tree Industry in Canada is a six-page pamphlet issued by the Forestry Branch of the Canadian Department of Resources and Development, Ottawa, Ont.

Prepared by Stanley Belsey, it represents the first accurate survey of the Canadian Christmas tree export trade. By way of introduction, mention is first made of the traditional use of Christmas trees, also the planting and growing. The statement is made that "The table tree, from one to three feet high is becoming more popular in the U.S." Our records show that there is little demand for a tree under two feet. However, the three-foot tree is now commonly used.

According to the survey, balsam fir makes up 46 percent of the harvested crop. Douglas-fir and spruce each supply 20 percent. Plantation grown Scots pine (now 9 percent) is increasing in popularity. Two-thirds of the trees harvested in Canada are shipped into the U. S., and during the past several years the number reaching the U. S. has been over seven million. In 1949 the total was 7,406,000 with a value of $2,317,000 an average of 31 cents per tree. Provinces of origin and exit are listed, as well as destinations in the U. S.

It is stated that the present annual Canadian Christmas tree harvest could be maintained in perpetuity on about 200 square miles of forest land.

A. M. SOWDER.

Missouri: Its Resources, People, and Institutions.

Edited by N. P. Gist, T. C. Morelock, C. M. Tucker, and W. F. English. 605 pp. Illus. University of Missouri, Columbia. 1950. $4.

Chock full of information on many phases of the natural resources, and social and business life of Missouri, this publication is the work of thirty-nine co-authors, most of them members of the faculty of the University of Missouri.

It is written primarily as an inventory of the state's resources. Obviously, much research has gone into its preparation. The book contains chapters on climate, geology, soil and water resources, mining and minerals, wildlife, forests, archeology, agriculture, health, education, business and finance, transportation, and several other subjects.

R. H. Westveld, head of the university's school of forestry, wrote the chapter on forests. He has packed a lot of interesting and factual data in 38 pages, not overlooking the social as well as the economic value of forestry to the state.

The chapters on soil resources, water resources, and wildlife are also well done.

The curators of the university are to be commended for sponsoring such a worthy project, and the editors for their restraint in not letting it become either a promotional volume or a dull catalogue of things and people.

Public Administration.

By Herbert A. Simon, Donald W. Smithburg, and Victor A. Thompson. 582 pp. Alfred A. Knopf, New York. 1950. $6.

The purpose of this book is to give a "realistic behavioral description of the processes of administration." Much attention is given to the human aspects, to recognition of the fact that an administrative entity is composed of people who act in certain ways because of what they are themselves and because of the influences of the society in which they work and live.

The subject is developed through analysis of individuals working in small groups, showing how organizational behavior can be understood and interpreted through application of a few basic notions of psychology and sociology. It is upon human behavior and basic administrative methods of subdividing work, securing teamwork, and effecting communication that large-scale administration and organization are approached. The authors feel strongly that top-level administrative problems cannot be comprehended or helpfully attacked without a thorough understanding of how groups behave and function.

While the book emphasizes public (governmental) administration, and gives attention to those problems of recruitment, organization, and political relations peculiar to

public bodies, the title is somewhat of a misnomer. The book is really about the *administration* of any kind of organization, public or private.

The book gives an understanding of how groups are put together and operate individually and collectively. But it is not a handbook for an administrator and is not written from his standpoint. Although an administrator can more clearly see himself and his function, a nonadministrative member of a group can gain perspective on his own contribution and also better understand the necessary functions of the leader. The student of administration, for whom the book is primarily written, can impartially examine the organism as a whole.

Because the book is long and contains a wealth of material, some patience is needed to sift it out. Some familiar concepts are presented in a new light. There is a penetrating analysis of "authority"; its real nature, why people accept or reject it, limits of authority and means of enforcing it. It is pointed out that authority is exerted upward as well as downward; subordinates may exert authority over their superiors in many ways.

There is an excellent discussion of careers in government and of the development of career ladders. Line and staff relations are thoroughly and realistically analyzed. The authors take a dim view of formal organization charts as expressing the realities of an organization; they contend that overhead units of staff and service groups exert authority in various ways whether the organization chart shows it or not. They point out that a necessary consequence of specialization and large-scale organization is that individuals must accept authority from many people and that a simple chain of command is impossible.

It is here that the authors are critical of the Hoover Commission reports. They contend that the commission accepted the "myths of staff"; that while they laid great emphasis on clear lines of authority from the top down, their actual recommendations confuse it through failure to recognize the facts of life about so-called staff and service groups.

While the book contains much excellent material, the reader with some knowledge of administrative matters may find the writing somewhat laborious and platitudinous.

Concerning forestry, the authors are familiar with the Forest Service and cite it frequently as an example of effective governmental organization and administration. Their grasp of forestry education is not so sharp, being viewed almost entirely in relation to the Forest Service, and it is unfortunate that some statements and implications that are not true are perpetuated in a recent and important book. On page 16: "Forestry schools, for example, train their students almost exclusively for the public service." On pp. 18-19 it is not understood that forestry schools increasingly recognize administration as an important part of a student's program. Foresters have always been rather administratively minded, in or out of forestry schools. Again on p. 336: "Until very recently, almost the entire output of the state schools of forestry was absorbed by the U. S. Forest Service and state forestry departments."

An important addition to the knowledge of administration with particular emphasis on the social and psychological aspects, this volume is thoroughly documented and provides an excellent avenue to much of the literature in this field.

KENNETH P. DAVIS,
University of Michigan.

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Western Stock Ranching.

By Mont H. Saunderson. 1950. 247 pp. Illus. University of Minnesota Press, Minneapolis 14, Minn. 1950. $5.

Are you using or recommending range management practices which are economically sound? What investment per head can one afford for range improvements in balancing seasonal forage needs? What forms and methods of cost accounting are usable in determining the feasibility of a particular practice? What production, costs, and income should prevail for a particular type of ranch as a standard of comparison to discover inefficiency and needed improvement? You will find help in answering these, and many more, perplexing problems in this recent guide to efficient ranch management.

Mont Saunderson, range economist with the U. S. Forest Service and author of more than a score of publications, has drawn freely upon his quarter-century of experience in illustrating the principles and practices with actual cases. The book is easy to read. Excellent typography on high-quality paper and sharp half-tone illustrations contribute to its value.

The author portrays ranching as combined livestock, range, and cropland management programs, adapted and balanced to use the resources most efficiently and economically. A regional pattern of resources and ranches is developed which makes the principles and locally varying practices that follow more understandable. He shows how the types of livestock and husbandry practices may be adapted to resource and economic objectives. This is followed by a consideration of grazing practices (an interesting review of range management) which contribute to efficient use of rangelands. Choice of feed crops for various production programs is employed rather extensively. The relationship of markets and prices to a planned program of production, together with production and income standards for different regions and types of ranches, is presented. A useful section on business management with production cost standards, forms, and methods of cost accounting, and financial planning follows. A long-time management plan for the ranch, integrating resources, production, and financing, is then developed. Finally, federal public land uses and policies are reviewed in some detail showing their relationship to the management of ranches using such lands.

The book might form a nucleus for a college course in range or ranch economics. However, for such courses it would appear desirable, if not essential, to add more information on soil and land-use classification and capabilities, land appraisal and evaluation methods, and local livestock husbandry, range management, and cropping practices.

As a general treatment of ranch economics, it should be a valuable guide for ranch owners and operators, especially if supplemented with local state agricultural experiment station bulletins. Like any economic guide, it must be adapted to current costs and prices; the author apparently recognized this need in supplying some footnotes to tables of costs showing postwar trends.

It is unfortunate that the range condition method of determining grazing capacity is obscured in a footnote on page 89. This method is becoming so widely used as to deserve amplification and illustration in the text.

Bankers, credit managers, realtors, and others having business connections with ranching will find the book useful. It should be required reading for all forest officers and range management technicians in the West!

C. H. WASSER,
Colorado A & M College.

Our Landed Heritage.

By Roy M. Robbins, 423 pp. Illus. Princeton University Press, Princeton, N. J. 1942. Reprinted by Peter Smith Publisher, New York, N. Y. 1950. $5.50.

Subtitled *The Public Domain* — 1776-1936, this book was written for the expressed purpose of attempting to "integrate American land history with the other forces that have shaped our civilization." It covers an epoch in our history during which our landed heritage, the great public domain, and its disposal were a major force in shaping our national economic and social structure.

The book has 24 chapters, divided into four parts. The four consecutive parts are appropriately titled: The Settler Breaks the Way; The West Welcomes the Corporation; The Corporation Triumphs; and The Government Forces Conservation.

Part one describes an era of land settlement by the settler. Its historical approach is not dissimilar to that made by other authors on the subject. Chapter three in this section, titled "Sectionalism" is exceptionally good. The author has carefully explained the economic and social conflicts that existed between the industrial East, the slave holding South, and the expanding agricultural West.

Part two develops the story of a period of land history which seemed to favor the capitalist, the corporation, and the foreigner if he had capital — this in spite of the intent of the legislation.

The slave holding South opposed the free land policy and chapter eleven titled "Slavocracy Opposes Free Land" shows the conflicts between the large plantation holders' ideas of land policy as against that of the government in using land gifts to establish the unmonied individual, the settler. This idea was well expressed by an 1855 source as follows:

"Every year in the North a larger number is supported by the alms of the states. The criminal statistics show a frightful increase of crime, especially in the offenses against property; the right to gratuitous education by the forced taxes of the property holder is already a part of the public law, and societies are formed to establish a similar right to an equal division of lands. They declare that the earth is the gift of God for the common use — that no one has a right to monopolize it for himself and his posterity — and that every man has a natural claim to an equal share in its enjoyment. The next step is to deny the right to transmit any kind of property by will or by inheritance, and to force a general redivision in every generation, if not an entire community of ownership."

Part three analyzes the separate land laws of the period and discloses the fraud and exploitation that occurred, due primarily to lax administration and misinterpretation of the law. Its summarization might well be "Any legislation without good administration is bad legislation."

Part four covers the period 1901 to 1935, the new era of government in conservation. The chronology is similar to most students of conservation, but Mr. Robbins has exposed public and private opinion for the period which illustrates well the old and still new conflicts between federal, state, and local governments, and between governments and industry.

Every student of public administration and conservation should read this book. In developing the history of land policy, Mr. Robbins did a tremendous amount of research in an attempt to determine the public sentiment and its effect on legislation. In addition to the historical records and public documents he has discovered a large amount of material in newspapers, magazines, letters, and journals, which have added greatly to the knowledge of the basic issues as they were seen by the average citizen and as their views ultimately had an effect on land administration.

The era covered by the book may be well described as the "formative or frontier era of American history," an era which was distinguished by government land subsidy to the individual, to the corporation, and industry. One cannot help but speculate on the demise of this era and the birth of our present one.

Government subsidy in dollars may now be counted in millions, but, after all, 130 million acres in grants to states and corporations for railroad construction, education grants, and homestead entries made a sizable gift for a benevolent Congress to use in subsidy.

First published by Princeton University Press in 1942, the book was long out of print until this new printing.

J. WHITNEY FLOYD,
Utah State College.

Current Literature

Compiled by MARTHA MEELIG, *Librarian, The New York State College of Forestry*

Range Management Section Compiled by FRANCES FLICK, *Library, U. S. Department of Agriculture*

General

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Forestry at Cornell . . . A Retrospect of Proposals, Developments, and Accomplishments in the Teaching of Professional Forestry at Cornell University. By R. S. Hosmer. 63 pp. Illus. Ithaca, New York. 1950. Ltd. distribution.

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Forest Resources

Forest Resources of South Central Montana. By T. L. Finch, W. C. Hodge, and M. E. Metcalf. 19 pp. Illus. Northern Rocky Mt. Forest and Range Expt. Sta., Missoula. Sta. Paper No. 23. 1950.

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Montana Forest Resources and Industry Statistics. By P. D. Kemp and M. B. Dickerman. 48 pp. Northern Rocky Mt. Forest Expt. Sta., Missoula. Sta. Paper No. 25. 1950.

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Spruce Budworm Control; A Cooperative Project in Maine. By H. B. Peirson. 8 pp. Illus. Maine Forest Serv., Augusta. Cir. No. 8. 1950.

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The Steam-Bending Properties of Certain Tropical American Woods. By Martin Chudnoff and F. F. Wangaard. 8 pp. Tables. Yale Univ. School of Forestry, New Haven, Conn. Tech. Rept. No. 6. 1950.

Weathering Characteristics of Certain Tropical American Woods. By Y. C. Cheo and R. C. Cranch. 5 pp. Tables. Yale Univ. School of Forestry, New Haven, Conn. Tech. Rept. No. 7. 1950.

Society Affairs

Compiled by ROBERT D. HOSTETTER, *Assistant Executive Secretary*

Officers and Members of the Council, 1950-1951

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University of Washington
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Southern Kraft Division
International Paper Company
Mobile 9, Ala.

Committee Issues Call for Nominations

President, Vice President, Nine Council Members to be Elected

All members are hereby notified that the regular biennial election will be held December 1, 1951. A president, vice president, and nine other members of the Council will be elected for the two-year term 1952-1953.

The present Council is listed in the box above. Any or all of these incumbents may be renominated, provided they accept the nomination in writing.

However, both President Evans and Vice President Herr have announced that they will not be candidates for office.

Membership on the Council is restricted by the Constitution to Members (formerly Senior Members) and Fellows. Any Member or Fellow is eligible to hold office who is in good standing and who accepts the nomination in writing and declares his willingness to serve if elected.

Each voter will have an opportunity to ballot on all candidates for office. Candidates for the office of president are voted on separately; the candidate who receives the highest vote is declared elected president, and the candidate who receives the next highest vote is declared elected vice president.

The nine remaining Council members are elected in accordance with the system of proportional representation. The procedure of proportional representation will be explained in a later issue of the JOURNAL. It is the system by which the Society has been electing Council members for more than a decade.

How Nominations Are Made

The Constitution (Article VIII, Section 2) states the conditions under which nominations are made by petition.

1. Each petition shall name but one candidate.

2. All candidates must be eligible to hold elective office.

3. A petition shall bear the signatures of at least ten voting members who at the time of signing the petition are eligible to vote in the coming election. (Eligible voting members are Junior Members, Members, and Fellows in good standing.)

4. A voting member may not sign more than one nominating petition for President or more than one nominating petition for a member of the Council. That is, he may sign two, but no more.

5. Petitions must be in the Society office by October 8, 1951.

The Society has no special form for submitting nominating petitions. They may be written as follows:

We, the undersigned voting members of the Society of American Foresters, hereby nominate John Doe, a Member (or Fellow), for the office of president (or member of the Council) for the two-year term 1952-1953.

All nominating petitions should be sent promptly to the Society office. The executive secretary will gladly provide information about nominating or election procedure.

According to the Constitution (Article VIII, Section 1) a Nominating Committee has been appointed by President Evans. The Committee is composed of the following members:

Chairman, Alf Z. Nelson, R.F.D., New Ipswich, N. H.

William C. Postle, Box 351, Winnfield, La.

Everett L. Hamilton, U. S. Forest Service, Glendora, Calif.

Alex J. Yorman, Box 83, Solon Springs, Wis.

Vincent Bousquet, Box 133, Centralia, Wash.

This committee is charged with the following duties:

1. To set the date of the election. (December 1, 1951 is the date.)

2. To provide for at least two candidates for the office of president, and at least nine candidates for membership on the Council.

3. To receive separate nominating petitions for the office of president and for each member of the Council, and to supplement such petitions when necessary with other nominations in order to comply with item 2 above.

The Nominating Committee will make no nominations of its own unless the voting membership fails to make the required minimum number of nominations by petition. Voting members should accordingly get busy and make their own nominations. For their information the distribution of Council members by states during the period 1937-1951 is shown in Table 1.

ALF Z. NELSON, *Chairman,*
Nominating Committee.

TABLE 1.—DISTRIBUTION OF COUNCIL MEMBERS BY STATES DURING PERIOD 1937-1951
(Presidents' names are in capital letters; vice-presidents', in italics)

State	1937-1938	1938-1939	1940-1941	1942-1943	1944-1945	1946-1947	1948-1949	1950-1951
Alabama				Smith, H. A.				Porter, Earl
California	Kotok, E. I.	Krueger, M.	Krueger, M.	{ Keen, F. P. { Baker, F. H.	{ Keen, F. P. { Baker, F. H.		Nelson, DeW.	Nelson, DeW.
Colorado			Peck, A. C.	Peck, A. C.			Spencer, J. W.	
Connecticut	CHAPMAN, H. H.	Bryant, R. C.[1]	Hawley, R. C.	Hawley, R. C.	Hawley, R. C.		McArdle, R. E.	McArdle, R. E.
District of Columbia	Collingwood, G. H.		*Kotok, E. I.*	Behre, E. C.				
Georgia		Kircher, J.				Evans, C. F.	*Evans, C. F.*	EVANS, C. F.
Idaho		Jeffers, D.				Evenden, J. C.	Evenden, J. C.	
Illinois						Coffman, J. D.		
Iowa		MacDonald, G.	MacDonald, G.					
Louisiana			Eldredge, I. F.	Eldredge, I. F.				
Maine								Demeritt, D. B.
Maryland	Besley, F. W.							
Massachusetts	Shepard, W.	Cline, A. C.						
Michigan	*Dana, S. T.*		Allen, S. W.	*Allen, S. W.*	*Allen, S. W.*	ALLEN, S. W.		Fontanna, S. G.
Minnesota				SCHMITZ, H.	SCHMITZ, H.			Kaufert, F. H.
Montana	Koch, E.		Gisborne, H.	Gisborne, H.	Smith, G.	Herr, C. S.	Herr, C. S.	*Herr, C. S.*
New Hampshire								Lindh, C. O.
New Mexico						Reecknagel, A.		
New York	Spring, S. N.	*Howard, W. G.*	Howard, W. G.	Howard, W. G.	Reecknagel, A.	Damtoft, W.		
North Carolina	Rhoades, V.	KORSTIAN, C. F.	KORSTIAN, C. F.		Damtoft, W.			
Oregon		Brundage, F. H.				Dunn, P. M.	Dunn, P. M.	Brundage, F. H.
Pennsylvania		Round, H. F.[2]	McIntyre, A. C.		Shirley, H. L.			
South Carolina							Flory, C. H.	
Tennessee		Baker, W. M.					Baker, W. M.	
Utah	Rutledge, R. H.	Rutledge, R. H.						
Washington	Winkenwerder, H.				Greeley, W. B.	{ Greeley, W. B. { *Martin, C. F.*	{ Greeley, W. B. { MARTIN, C. F.	Marckworth, G.
Wisconsin					Price, J. H.	Price, J. H.		

[1]Died February, 1939. [2]Succeeded Bryant, deceased.

Election of Fellows To be December 1

Nominations Close on October 8

All Members (formerly Senior Members) and Fellows of the Society are hereby advised that nominations for the grade of Fellow are now open. The election of Fellows will be held at the time of the Society's regular biennial election December 1, 1951.

As defined by the Constitution (Article III, Section 6), "Fellows shall be foresters of outstanding achievement as leaders in responsible directive or distinctive individual work of a fruitful character. They shall be elected from the Members and shall be engaged in forestry work at the time of their election."

Nominations by Petition

The procedure for placing Members in nomination for the grade of Fellow is by petition. The Society has no printed form for this purpose; the petition may be typewritten thus:

We, the undersigned Members and Fellows of the Society of American Foresters, hereby nominate ———— to be considered for election to the grade of Fellow in 1951.

Remember these simple rules:

1. A petition may not name more than one candidate.

2. It must be signed by 25 Members or Fellows in good standing.

3. It should be accompanied by a factual, not eulogistic, biographical sketch of at least 200 words giving an account of the nominee's professional career and accomplishments.

4. It must be received in the executive office of the Society in Washington, D. C., not later than October 8, 1951.

The executive employees of the Society cannot be responsible for obtaining signatures on partially completed petitions or on petitions incomplete by reason of unacceptable signatures (that is, signatures of other than Members and Fellows in good standing).

Election Procedure

Fellows are not elected by the membership at large, but by a board of electors which consists of all present Fellows and the present Council. (A Council member who is also a Fellow has but one vote.)

The system is described in Article 4, Section 4 of the Constitution. To win election a candidate must receive an affirmative vote of not less than one-half the total votes cast.

Significance of the Grade

The highest membership distinction that can be conferred by the Society, this grade is awarded in recognition of outstanding achievement. Fellows do not pay increased dues; their dues are the same as those of Members.

Since the Society was founded in 1900, there have been 77 Fellows elected. At the present time the number of living Fellows is 57.

Since the last election in December 1949, four Fellows have died: H. P. Baker, C. G. Bates, E. G. Cheney, and J. C. Gifford.

List of Fellows

The current roster of Fellows follows. The state in which each Fellow is domiciled and the year of his elec- are shown after his name.

Allen, S. W. Michigan. 1948.
Baker, F. S. California. 1949.
Brundage, F. H. Oregon. 1949.
Besley, F. W. Maryland. 1940.
Butler, Ovid. Maryland. 1940.
Carter, E. E. District of Columbia. 1942.
Chapman, H. H. Connecticut. 1922.
Clapp, E. H. Maryland. 1930.
Clepper, Henry. Virginia. 1949.
Coffman, J. D. District of Columbia. 1946.
Dana, S. T. Michigan. 1935.
Eldredge, I. F. Louisiana. 1942.
Evans, C. F. Georgia. 1949.
Ferguson, J. A. Pennsylvania. 1949.
Fischer, A. F. California. 1940.
Frothingham, E. H. California. 1942.
Gill, Tom. District of Columbia. 1948.
Girard, J. W. Oregon. 1944.
Granger, C. M. District of Columbia. 1946.
Graves, H. S. Connecticut. 1918.
Greeley, W. B. Washington. 1918.
Guthrie, J. D. Virginia. 1942.
Hall, W. L. Arkansas. 1940.
Hartley, Carl. Maryland. 1949.
Hawes, A. F. Connecticut. 1939.
Hawley, R. C. Connecticut. 1942.
Holmes, J. S. North Carolina. 1939.
Hosmer, R. S. New York. 1932.
Illick, J. S. New York. 1946.
Jeffers, D. S. Idaho. 1948.
Kelley, Evan. Montana. 1949.
Kellogg, R. S. Florida. 1949.
Kinney, J. P. District of Columbia. 1942.
Koch, Elers. Montana. 1940.
Korstian, C. F. North Carolina. 1942.
Lowdermilk, W. C. California. 1948.
MacDonald, G. B. Iowa. 1944.
Marsh, R. E. District of Columbia. 1948.
Martin, C. S. Washington. 1948.
Mason, D. T. Oregon. 1948.
Mulford, Walter. California. 1939.
Munger, T. T. Oregon. 1946.
Munns, E. N. District of Columbia. 1949.
Peavy, G. W. Oregon. 1939.
Peck, A. S. Colorado. 1946.
Preston, J. F. Maryland. 1948.
Schmitz, Henry. Minnesota. 1940.
Show, S. B. District of Columbia. 1948.
Siecke, E. O. Texas. 1946.
Sparhawk, W. N. New Hampshire. 1946.
Spring, S. N. New York. 1939.
Watts, L. F. District of Columbia. 1946.
Wilson, Ellwood. Quebec. 1949.
Winslow, C. P. District of Columbia. 1942.
Wirt, G. H. Pennsylvania. 1948.
Ziegler, E. A. Florida. 1949.
Zon, Raphael. Minnesota. 1918.

Nominations Received

Petitions nominating Members to the grade of Fellow have already been received for the following:

Hugh Curran of Venezuela.
Emanuel Fritz of California.
DeWitt Nelson of California.
Harold S. Newins of Florida.

S. A. F. Members Advise Scouts

Eight members of the Society of American Foresters participated in a conservation program workshop at the Schiff Scout Reservation, Mendham, N. J., on January 26-28, 1951.

Representatives of thirty organizations were invited by the National Office, Boy Scouts of America, to participate in the workshop which was designed to aid in planning the conservation activities of that organization on a nation-wide basis. The meeting had a two fold purpose, to recommend conservation measures for application on camps operated by local scout councils, and to provide assistance to scouts and scouters in improving conservation practices in general in their own localities.

Society members participating in the conservation program workshop included Floyd E. Carlson, State University of New York, College of Forestry; Richard J. Costley, Allegheny National Forest; Harry W. Dengler, Maryland Extension Service; Robert D. Hostetter, Society of American Foresters; Otto G. Koenig, Eastern Region, U. S. Forest Service; C. W. Mattison, Forestry Education Consultant, Washington Office, U. S. Forest Service; G. E. Nietzold, Cumberland National Forest; Arthur M. Sowder, Extension Forester, Washington Office, Extension Service.

Gulf States Section Elects New Officers

New officers of the Gulf States Section have been elected five months in advance of the usual time, in order that plans for the Society's 51st annual meeting can be carried forward without interruption. The meeting will be held on December 12-15, 1951 at Biloxi, Miss.

New chairman of the Section is James E. Bryan, Jr., L. N. Dantzler Lumber Co., Perkinston, Miss. T. E. Maki, Box 122, Gulfport, Miss., is the new vice chairman, and John G. Guthrie, Illinois Central Railroad, Hattiesburg, Miss., will serve as secretary-treasurer. Their official terms are from May 1951 to May 1952.

Incumbent Section officers are James H. Kitchens, Jr., chairman; W. M. Palmer, Jr., vice chairman; and J. W. Myers, Jr., secretary-treasurer.

The vice chairman serves as chairman of the membership committee.

Southeastern Section Debates Regulation

Two panel discussions were features of the meeting of the Southeastern Section held on January 12 and 13, 1951 in Albany, Ga. Subject of the first was "Public Assistance to the Private Landowner in Forest Management," with A. E. Patterson as moderator. The other was "Is Public Regulation Necessary?" with R. V. Miles, Jr. as moderator. "Both subjects developed such lively discussions and diverse opinions that it was necessary for the respective moderators to close their subjects long before any agreements could be reached," stated Eugene W. Gemmer in his report of the meeting.

At the business meeting, Jack May, chairman of the Section's membership committee, reported that on the basis of his estimate the applications for membership currently being processed would bring the Section's membership to a total greater than that of the Columbia River Section.

Charles F. Evans, Society president, announced that Society officers and Council members will be elected on December 1, 1951 and suggested that steps should be taken to nominate suitable candidates.

Approximately 250 members and guests attended a buffet dinner on the evening of January 12. The subject of a talk by Col. Earle Norman, Washington, Ga., which followed the dinner, was "Working With Youngsters."

The following Section officers were elected to serve for the ensuing year: Chairman, Joseph T. McCullough, Collier Corporation, Everglades, Fla.; Vice Chairman, Daniel C. Royal, Miller Lumber Company, Selma, Ala.; Secretary-Treasurer, Eugene W. Gemmer, State Forest Ranger School, Lake City, Fla.

Meetings Recorded

In the January 1951 issue of *The Ozark Reporter*, newsletter of the Ozark Section, a history of the Section's meetings was reported in tabular form. Included were the names of the officers at the time of each meeting, the place and date of the meeting, the number in attendance, and the total membership of the Section.

The Section was organized in 1929 and has had 36 meetings since that time. It traditionally holds a winter meeting and a summer field meeting.

Lawson M. Anderson is the editor of *The Ozark Reporter*.

School Executives Favor Liberalization

Liberalization of the requirements for Junior Membership as established by the Society Council in October 1949 was recommended by the Council of Forestry School Executives in their meeting which was held in Washington, D. C., on December 16 and 17, 1950. A committee will study the problem further and report at the next meeting which is to be held in Biloxi, Miss., in December 1951.

The forestry school heads agreed that in individual cases where graduates of accredited schools, but in curricula other than those approved, applied for membership the application would be supported by a statement from the dean listing the courses completed by the student to make him eligible for membership.

In considering other aspects of Society membership problems, the Council of Forestry School Executives recommended that the requirements of the Associate grade be altered to allow individuals in related professional fields to become Associate Members as soon as they have graduated.

New York Section Reviews Practice Act

At the winter meeting of the New York Section, the 146 members present reviewed the accomplishments of the New York State Practice Act. The meeting was held in Syracuse, N. Y., on January 25 and 26, 1951.

The first half day was devoted to considerations of the Forest Practice Act on the state and local levels. Speakers were Arthur S. Hopkins, E. W. Littlefield, John E. Keib, Fred E. Winch, Jr., A. C. McIntyre, J. D. Kennedy, D. S. Findlay, Walter Letts, and Lewis C. Watts.

Serving on the first afternoon panel as representatives of wood-using industries were George D. Manion, John Stock, Gerard A. Pisez, and Henry Gallien.

On the second afternoon panel the speakers and their topics were: Leland Smith, "F.P.A. and the New York State Grange"; Mrs. Walter L. Slifer, "F.P.A. and the New York State Federation of Garden Clubs"; Howard E. Conklin, "F.P.A. as It Relates to Land Use Problems in New York"; and W. S. Swingler, "F.P.A. as Compared to Similar Acts in Other States."

A buffalo dinner preceded talks on Thursday evening by Arthur S. Hopkins and Leslie S. Bean. Their topics, respectively, were "The Great Storm of November 25, 1950 and "The New England Timber Salvage."

Saturday morning was devoted to Section and Society business. James E. Davis, State University of New York, College of Forestry, Syracuse 10, N. Y., was elected as secretary-treasurer to succeed David B. Cook. Alexander M. Ross, Newton Falls Paper Mill, Newton Falls, N. Y., was elected to succeed Gerard A. Pisez as a member of the executive committee. The two-year terms of Chairman A. J. Woodford and Vice Chairman Fred E. Winch continue for another year. Committee reports were presented by Ralph G. Unger, James M. Owens, Allen W. Bratton, Gustav A. Swanson, James D. Kennedy, and Cedric H. Guise. Robert D. Hostetter, assistant executive secretary, reported on current Society policies and activities.

Following a discussion regarding requirements for Junior Membership as influenced by the Council's list of basic forestry courses which must be included for a curriculum to be approved, Chairman Woodford appointed a committee to study the problem further and report before the Council meets in June. Members of the committee are Earl Stone, Cedric Guise, and L. P. Plumley.

The meeting arrangements were made by a committee with Floyd E. Carlson and Svend O. Heiberg as its co-chairmen.

Chapter Notes

Chapters in the Central States Section have found it both convenient and economical to use the Section's addressograph plates in addressing Chapter mail. C. S. Walters, secretary-treasurer of the Central States Section, reports that the charge to Chapters for the service is approximately as follows for 150 4" x 9½" envelopes: envelopes, 47 cents; addressograph labor, 25 cents; postage, 19 cents; or a total of 91 cents. The Section maintains a current addressograph file on all Section members.

Officers elected at an October field meeting of the Lower Michigan Chapter were John L. Arend, chairman; James Herman, vice chairman; and Elton Twork, secretary-treasurer.

Problems of a critical fire year were discussed at a meeting of the Bay Area Chapter of the Northern California Section last fall. New equipment, fire control plans, training systems, urban invasion of high-hazard sites, and increasing forest values were subjects discussed.

The Illinois Technical Forestry Association, which is a Chapter of the Central States Section, met in October on the Sinnissippi Forest, Oregon, Ill. The meeting was planned by Harold W. Fox, Sinnissippi forester, in cooperation with foresters from the University of Illinois and Purdue University, and W. C. Mulford, director of Camp Lowden which is operated by the Boy Scouts of America.

George R. Moorehead has been elected chairman of the New Jersey Chapter of the Allegheny Section. Other officers elected at a field meeting of the Chapter were John M. Heilman, William Phoenix, James C. MacDonald, and Glen Smith.

The Longleaf Chapter of the Gulf States Section toured the wire-bound box plant, pole manufacturing and creosoting plant, and tung oil mill operated by Crosby Forest Products Industries at Picayune, Miss.

Light crown thinning, with logs and poles as the objective, proved most profitable on sample plots in a 26-year-old slash pine stand, according to A. Bigler Crow who analyzed the results at a December meeting of the Southeast Louisiana Chapter of the Gulf States Section. The plots were established in 1937 by A. D. Folweiler in cooperation with Gaylord Container Corporation.

Dues Deductible

In filing U. S. income tax reports, all members may classify dues paid to the Society of American Foresters as deductible expenses.

Dues for 1951 should be paid promptly and in no case should they remain unpaid after June 30, 1951. Members whose dues are not paid by that date will receive no further issues of the JOURNAL OF FORESTRY until dues are paid.

Canadian members may pay their dues in Canadian funds. All subscriptions to the JOURNAL OF FORESTRY must be paid in U. S. funds.

Tree Forester Approves Peripheral Divisions

Although I am sure that I have no complete solution to the difficult problem of the subject-matter Divisions of the Society of American Foresters, I would like to present in a little more careful detail the points which I tried to develop briefly at the breakfast meeting of the Division officers and Council in Washington last December 14. My criticisms of the present situation are essentially that the Divisions are (1) too numerous, (2) too independent of the Council, (3) too cumbersome. To consider these three points it is perhaps wise to look into the objectives of these Divisions.

Objectives of the Divisions

It seems apparent that the subject-matter Divisions have two major functions: (1) to manage the Divisional programs at the annual meetings, (2) to push forward the special interests of the Divisions by year-round committee work on Divisional projects. All Divisions participate in the first; the second function is irregular.

The practice of holding Divisional sessions is certainly sound and has contributed much to the popularity of the annual meetings. It is, of course, widely used by other similar societies. The Divisional meetings serve several purposes.

1. They permit adequate attention to special fields in which a limited number of men have special interests—the peripheral groups like Range Management and Wildlife. This is a highly desirable thing, for few if any of these specialties can be introduced into the general programs of the main meetings. Such group meetings fill a real need and tend to bind these peripheral groups to forestry. At the same time, I would think their programs should cover the meeting ground of forestry and the specialty. This year the Wildlife program did this excellently; the Range Management papers were mostly equally or more appropriate to a meeting of the American Society of Range Management. This is a point in favor of more direct Council control of the subject-matter programs.

2. These meetings permit groups representing highly technical aspects of forestry to get together for intensive consideration of their specialty. This type of group would be best typified by the proposed Division of Mensuration. I believe that this viewpoint has been involved in the establishment of such divisions as Silviculture, Education, and Forest Economics. Long before there was a Division of Silviculture I was hopeful that there could be such narrow group meetings, attended by a few dozen men, intent on thrashing out esoteric problems. Things do not work out that way, however. Papers presented orally cannot permit study of complex situations and masses of data, and so the programs of all these groups have for many years consisted mainly of papers that would be equally appropriate and well received by the entire Society. Note the very heavy attendance, denoting the breadth of interests involved.

3. That young "unknowns" with new ideas will have a chance to be heard in Divisional meetings, whereas they would have no chance on the main program, is an argument advanced in favor of the Divisions. In theory it is sound but it has not worked out too well. The incompetent has not been well separated from the competent. The young man eager for advancement seems sometimes to have strained for a point upon which to hang a paper rather than presenting a truly "hot" idea. And the type of paper which is good is usually laden with data and facts which would be far better presented in the pages of the JOURNAL than in oral form.

4. I have heard it claimed that the Divisional meetings permit the youngsters to meet the "old maestros" more intimately than they could in the main meetings. This would be true if the Divisional meetings themselves were not so large as they have grown to be.

Thus, it appears that the set-up of Divisions has permitted the "peripheral" groups to maintain a desirable degree of unity without splitting off from the Society—a highly desirable situation. The "central" groups, on the other hand, have really done little more than give opportunity for the presentation of a greater number of papers by virtue of their divisional status.

"Peripheral" and "Central" Divisions

I have divided the papers given at the Washington meeting into two groups—based largely on titles, for I heard only a fraction of them, (1) specialized and (2) general. Setting myself up as a reasonably normal and narrow "tree forester," I placed in group one all those papers which seemed too specialized to have much appeal to me. In group two were the titles that seemed to have a good broad appeal to a tree forester such as I.

The results divided the Divisions into two clear-cut groups: the first having less than 25 percent of the papers of broad appeal and including Education, Public Relations, Range Management, Forest Recreation, Watershed Management, and Forest-Wildlife Management Divisions. These make up the "peripheral" groups. The second group ran over 60 percent in papers of general interest: Silviculture, Forest Economics (jointly with Silviculture), Private Forestry, Forest Products. These are the "central" groups.

Now, it seems obvious to me that the annual meeting is primarily geared to the listener, not the speaker. Nobody can expect more than about two days' worth of good listening, and when two, three, or a half dozen good general speeches are going on at once nothing in particular is to be gained—the affair becomes redundant. A six-ring circus is not twice as good as a three-ring circus unless you are catering to the performers—not the audience. Thus the 27 papers I regard as of genuine general interest, presented in the Divisional meetings, are more or less redundant. Twenty out of these twenty-seven were presented at the meetings of the Silviculture, Economics, Private Forestry, and Forest Products Divisions — the "central" group.

Simplification in Central Group

Here—it seems to me, there is room for pruning either drastically by doing without some of these "central" divisions (silviculture, for example), or less drastically by encouraging joint meetings by two or even three of them. Or by uniting one central and one peripheral group as silviculture-watershed management. The formation of new divisions in this "central" field (management, mensuration) should certainly be discouraged. It is interesting to note that these "central" Divisions cover fields that have been set up as required in every approved forest school curriculum. None of the "peripheral" divisions cover required field of study. This might yield a yardstick for determining the legitimacy of the Division as a separate entity. It seems obvious that we cannot go on multiplying Divisions and granting every application no matter how earnestly the cause may be presented. In this connection I would again call attention to the fact that in the history of all Divisional programs there is very little getting together to discuss narrow and highly technical matters—this year Public Relations came closest to doing it. I believe many proponents of new Divisional units have this

strongly in mind. But it doesn't seem to work out that way at all.

Divisional Organization

If the primary function of the Division is to arrange the program of the annual meeting (note well the *if*) the degree of autonomy that is granted and the general form of organization may well be questioned. It is true that it relieves the Council and Executive Secretary of much detail and places the burden of success or failure of the program squarely upon the Division, but the whole business of formal slates of officers, minutes, reports, elections, by-laws (always missing), and so forth is pretty cumbersome, when a simple committee of three to five, appointed by the Council, could rig up just as good a program and could do it under orders of the Council as to time allowances, combinations with other Divisions, general overall linkage with the main theme of the meeting, etc.

In this connection I am thinking of the Division of Education, a peripheral group that cuts across all lines of interest in such a way that it needs to be scheduled at a time when there is no competition, if success is to be attained. (The attendance at Washington where this was done was heavy; last year at Seattle where it was not done a mere handful attended.) We had an excellent program this year but always tend to hash over the same ground; our critics do the same also. Might it not be wise to permit this group to put on a program only every second year? Next year at Biloxi, I am sure the time could be better spent in the field than in discussing insoluble problems of education.

I would therefore propose Divisional program committees appointed by the Council and reporting to the Executive Secretary as a means of better correlating the programs of the Divisions and the Divisions with the main program as a step toward developing compact and effective overall programs for the annual meetings.

Other Divisional Responsibilities

The last section all hinged upon an "if." It may well be that the Divisions have more important functions than merely developing a good annual program. Several of them have committees which are more or less active in developing appropriate reports, policies, plans, etc. This work is laudable and does make a formal organization desirable. The very existence of the "Division" stimulates such activity and furnishes the mechanism whereby it can be facilitated.

Yet at the same time it can be said equally truly that artificially stimulated committee work tends to be thin and of low value. Good work of this type hinges upon real needs, a spark-plug chairman, and enthusiasm. Given these three things the job usually gets done whether the mechanisms are set up or not. The committees of the Division of Silviculture could as well be committees of the Society and, in fact, one of them originally was such a committee. It has been no more productive under the Division than before. In fact, I believe, Society committees are taken more seriously than Divisional committees.

Thus I see no *necessity* of maintaining the Divisional set-up to facilitate other work than the preparation of programs, although I do grant the possibility of values in this direction.

Summary

In order to pull together and simplify the work of the subject-matter Divisions several lines of improvement are open.

1. The Divisions which I have called "peripheral" have every reason for existence in some form and their number might conceivably be increased.

2. The Divisions which I have called "central" have small justification as separate bodies.

3. If the main purpose of the Divisions is to formulate programs, a better job could be done through committees appointed by the Council. These committees would be charged with certain duties regarding time allotments, cooperation with other subject-matter committees, nature of the programs, for these Divisions are designed to serve the Society, not the reverse.

4. If the mission of the Divisions is broader than program preparation a simple organization should be provided for. It is suggested that all Divisions might well have common by-laws framed so as to reduce to a minimum the amount of business to be transacted at the annual meetings. Overly elaborate organizations are not only cumbersome but they waste the Society's money.

Specifically, I think the situation would be improved without stepping on too many toes if:

1. Certain "central" divisions were induced to double up their programs.
2. The Executive Secretary were less generous as to time allotments.
3. The Division of Education met only biennially.
4. A "model" set of by-laws was sent out, setting up a simple election system and a strong executive committee for each Division (Education is wonderfully simple; Silviculture is too elaborate).

F. S. BAKER, *Dean,*
School of Forestry,
University of California.

(What do other members, past and present Division officers in particular, think of Dean Baker's suggestions?—Executive Secretary.)

Candidates for Membership

Candidates for membership whose applications were received in the Society office prior to February 1, 1951 are listed below. Names, positions, addresses, and education are given.

Action regarding the eligibility of these candidates will be taken by the Council as of April 1, 1951. Comments, protests, or important information regarding the qualifications for membership of candidates listed are invited from present voting members. All such communications are kept strictly confidential, being used only by the Council in taking final action on applications. Correspondence should be received in the Society office prior to April 1, 1951.

The names of those candidates who are elected will be published in the Society Affairs department of the May 1951 JOURNAL OF FORESTRY. The names of those who signify their acceptance of election will be published in subsequent issues of the JOURNAL.

Allegheny Section

Junior Grade

Knechtel, W. C., 3225 Gaylord Ave., Pittsburgh, Pa.; Pa. State, B.S.F., 1951.

Miller, R. M., 525 4th St., Pitcairn, Pa.; Pa. State, B.S.F., 1949.

Steigerwalt, M. A., 616 Lafayette Ave., Palmerton, Pa.; Pa. State, B.S.F., 1951.

Member Grade

Blatt, J. A., Asst. Forester, Forestry Div., Pittsburgh, Pa.; Pa. State, B.S.F., 1943. (Junior, 1944).

Davis, J. F., Asst. Dist. Forester, Md. Dept. of State Forests and Parks, Annapolis, Md.; Univ. of Mich., B.S.F., 1947. (Junior, 1948).

Harr, H. M., Forest Mgmt., Cons. Comm. of W. Va., Charleston, W. Va.; W. Va. Univ., B.S.F., 1939. (Junior, 1946).

Johnson, F. M., 36 Estill Drive, Charleston, W. Va.; W. Va. Univ., B.S.F. 1939; Univ. of Mich., M.F., 1946. (Junior, 1946).

Phoenix, W. B., Asst. Div. Firewarden, Dept. of Cons., Toms River, N. J.; N. Y. State, B.S.F., 1942. (Junior, 1947).

Appalachian Section

Junior Grade

Besse, J. D., N. C. State, Raleigh, N. C.; Univ. of Minn., B.S.F., 1950.

Brank, G. P., 515 N. Boundary St., Raleigh, N. C.; N. C. State, B.S.F., 1950.

Crider, J. M., Jr., 66 B Rutledge Ave., Charleston, S. C.; Univ. of Ga., B.S.F., 1950.

Force, N. F., Forester, Southern Forest Exp. Sta., Asheville, N. C.; Univ. of Mich., B.S.F., 1939. Reinstatement.

Furr, W. C., Box 58, Concord, N. C.; N. C. State, B.S.F., 1950.

George, H. H., 419 Gaston Ave., Belmont, N. C.; Univ. of Ga., B.S.F., 1950.

Harmon, J. B., III, Box 381, Newberry, S. C.; Univ. of Ga., B.S.F., 1950.

Jefferies, R. H., Box F., Chapin, S. C.; Univ. of Ga., B.S.F., 1950.

Lorentzen, F., Jr., Forester, U.S.F.S., Asheville, N. C.; Univ. of Mich., B.S.F., 1948.

Padgett, J. R., Box 82, Black Mountain, N. C.; N. C. State, B.S.F., 1950.

Peery, G. W., Jr. Service Forester, Dept. of Cons., Salem, Va.; Mich. State, B.S.F., 1950.

Member Grade

Boice, L. M., Consulting Forester, 555 Whitman St., Orangeburg, S. C.; N. Y. State, B.S.F., 1943. (Junior, 1946).

Cutler, V. H., Asst. Forester, S. C. State Comm. of Forestry, Camden, S. C.; Iowa State, B.S.F., 1940. (Junior, 1947).

Douglas, R. S., Forestry Ext. Spec., Agric. Ext. Service, Clinton, N. C.; N. C. State, B.S.F., 1942. (Junior, 1947).

Ellis, W. J., Jr., Forester, Southern Johns-Manville, Jarratt, Va.; N. C. State, B.S.F., 1947. (Junior, 1947).

Hicks, L. E., Dist. Forester, N. C. Dept. of Cons., Fayetteville, N. C.; Iowa State, B.S.F., 1939. (Junior, 1949).

Oliver, H. R., Area Forester, Champion Paper and Fibre Co., Newberry, S. C.; Univ. of Ga., B.S.F., 1943. (Junior, 1946).

Robinson, J. T., Box 598, Summerville, S. C.; Univ. of Ga., B.S.F., 1942. (Junior, 1946).

Affiliate Grade

Schwartz, C. M., Grad. Student, Duke Univ., Durham, N. C.; Univ. of Conn., B.S., (Forestry), 1948.

Central Rocky Mountain Section

Junior Grade

Elliott, J. R., Box 832, Gunnison, Colo.; Colo. A & M, B.S.F., 1950.

Hallinan, J. P., Thr. Mgmt. Asst., Pierre, S. Dak.; Univ. of Mich., B.S.F., 1950.

Member Grade

Emerson, J. W., c/o U.S.F.S., Dolores, Colo. (Junior, 1928).

Central States Section

Junior Grade

Barclay, W. H., Grad. Student, Univ. of Mich., Ann Arbor, Mich.; Univ. of Mich., B.S.F., 1950.

Gustafson, R. E., 212 Third St., Ann Arbor, Mich.; Univ. of Mich., B.S.F., 1950.

Lecheler, L. E., Grad. Student, Univ. of Mich., Ann Arbor, Mich.; Univ. of Mich., B.S.F., 1950.

Member Grade

Carter, L. A., Instructor in Forestry, Mich. State College, East Lansing, Mich.; Mich. State, B.S.F., 1924. Reinstatement

Columbia River Section

Junior Grade

Francis, J. B., Rgr. Sta., Mapleton, Oreg.; Mich. State, B.S.F., 1949.

Hubbard, F. W., Jr., Laborer, Weyerhaeuser Tbr. Co., Longview, Wash.; Mich. State, B.S.F., 1950.

Jetley, M. A., Exp. Aide, Oregon State College, Corvallis, Oreg.; Utah State, B.S.F., 1950.

Stevens, C. M., Box 368, Union, Oreg.; Oregon State, B.S.F., 1950.

Member Grade

Barber, M. F., Forester, U.S.F.S., Hebo, Oreg.; Iowa State, B.S.F., 1942. (Junior, 1946).

Gansberg, W. O., Asst. log. Buyer, Buffelen Mfg. Co., Camas, Wash.; Univ. of Calif., B.S.F., 1940. (Junior, 1945).

Gibson, R. C., Gen. Supt., Long-Bell Lbr. Co., Eugene, Oreg.; Oregon State, B.S.F., 1926. (Junior, 1946).

Hoelscher, L. B., Asst. Branch Forester, Weyerhaeuser Tbr. Co., North Bend, Oreg.; Univ. of Minn., B.S.F., 1929. (Junior, 1947).

O'Leary, J. E., Instructor, Forestry School, Oregon State, College, Corvallis, Oreg.; Univ. of Mich., B.S.F., 1942; Oregon State, M.F., 1947. (Junior, 1949).

Peick, C. F., Forester, U. S. Indian Service, Klamath Agency, Oreg.; Univ. of Wash., B.S.F., 1923; Yale, M.F., 1926. (Junior, 1936R48).

Prater, J. D., Resident Forester, Crown Zellerbach Corp., Cathlamet, Wash.; Univ. of Idaho, B.S.F., 1938; Univ. of Wash., M.F., 1946. (Junior, 1946).

Sartz, R. S., Forester, Pacific N. W. Forest and Range Exp. Sta., Portland, Oreg.; Pa. State, B.S.F., 1941. (Junior, 1945).

Seymour, L. H., Resident Forester, Roaring River Tree Farm, Scio, Oreg.; Oregon State, B.S.F., 1948. (Junior, 1949).

Simpson, L. L., Secy-Mgr., and Forester, Southern Oregon Cons. Assoc., Medford, Oreg. (Junior, 1946).

Stewart, L. L., Resident, Bohemia Lbr. Co., Culp Creek, Oreg.; Oregon State, B.S.F., 1932. (Junior, 1946).

Surdam, E. L., Mgr., Natl. Forest Industries, Portland, Oreg.; Oregon State, B.S.F., 1939. (Junior, 1947).

Venator, J. D., Forester, Bigley and Feiss, Foresters, Inc., Eugene, Oreg.; Oregon State, B.S.F., 1941. (Junior, 1946).

Williams, G. W., Forester, U.S.F.S., Corvallis, Oreg.; Mich. State, B.S.F., 1941. (Junior, 1946).

Withee, O. A., Thr. Mgmt. Asst., U.S.F.S., Prineville, Oreg.; Univ. of Minn., B.S.F., 1940. (Junior, 1947).

Affiliate Grade

Butler, L. E., Thr. Mgr., Youngs Bay Lbr. Co., Roseburg, Oreg.

Gulf States Section

Junior Grade

Barrett, C. D., Box 42, Philadelphia, Miss.; Univ. of Ga., B.S.F., 1950.

Brown, D. E., Asst. Woods Supt., Newport Industries, Inc., Oakdale, La.; La. Poly. Inst., B. A., 1933. (Affiliate, 1949).

Knouse, H., Jr., Forest Tech., International Paper Co., Colfax, La.; La. State, B.S.F., 1949.

Phillips, H. L., Dist. Forester, Miss. Forest Service, Meridian, Miss.; Ala. Poly. Inst., B.S.F., 1948.

Ray, F. A., Supt. Procurement, Newport Industries Inc., Oakdale, La. (Affiliate, 1948).

Member Grade

Belebrad, L. W., Forester, Long-Bell Lbr. Co., DeRidder, La.; Iowa State, B.S.F., 1942. (Junior, 1949).

Cockroct, R. S., Forester, C. M. Gooch Lbr. Co., Jackson, Miss.; Univ. of Mich., B.S.F., 1941. (Junior, 1947).

Griffin, W. F., Dist. Forester, International Paper Co., Springhill, La. (Junior, 1949).

Lewis, C. H., Jr., Forester, Crosby Lbr. and Mfg. Co., Crosby, Miss.; La. State, B.S.F., 1939. (Junior, 1948).

Moore, L. H., Forester, Chicago Mill and Lbr. Co., Greenville, Miss.; La. State, B.S.F., 1939. (Junior, 1948).

Seagle, W. D., Forester, U.S.F.S., New Albany, Miss.; Colo. A & M., B.S.F., 1936. (Junior, 1948).

Affiliate Grade

Scalfi, R. A., Woods, Supt., Crosby Chemicals, Inc., DeRidder, La.; Chillicothe Business College. (1 yr.).

Inland Empire Section

Junior Grade

Laurent, T. H., Fire Control Aide, U.S.F.S., Challis, Idaho; Univ. of Idaho, B.S.F., 1950.

Member Grade

Boy, G. L., Forester, U.S.F.S., Grangeville, Idaho; Univ. of Idaho, B.S.F., 1940. (Junior, 1946).

Burnett, T. S., Plant Supt., Diamond Match Co., Spokane, Wash.; Univ. of Mont., B.S.F., 1940. (Junior, 1947).

Ellis, E. L., Asst. Prof., Univ. of Idaho, Moscow, Idaho; Univ. of Wash., B.S.F., 1941; Mich. State, M.F., 1943. (Junior, 1945).

Gynn, J. C., Supv., Blister Rust Control, Spokane, Wash.; College of Puget Sound, B.A., 1931. (Junior, 1946).

Neff, P. E., Dist. Rgr., U.S.F.S., Sandpoint, Idaho; Mont. State, B.S.F., 1940. (Junior, 1946).

Peterka, M. J., Logging Supt., White Pine Lbr. Co., Orofino, Idaho; Univ. of Calif., B.S.F., 1945. (Junior, 1947).

Rittcheimer, E., Logging Supt., Potlatch Forests Inc., Bovill, Idaho; Univ. of Idaho, B.S.F., 1939. (Junior, 1948).

Intermountain Section

Junior Grade

Haupt, H. F., Range Cons., U.S.F.S., Intermountain Forest and Range Exp. Sta., Ogden, Utah; Univ. of Idaho, B.S.F., 1948.

Kentucky-Tennessee Section

Junior Grade

Bartyle, W. G., 175 Vandaliz Rd., Oak Ridge, Tenn.; Univ. of Ga., B.S.F., 1950.

Member Grade

Ellenberg, E. G., Forester, U.S.F.S., Atlanta, Ga.; N. C. State, B.S.F., 1943; M.F., 1947. (Junior, 1947).

Morrill, W. M., Soil Cons., U.S.D.A., Booneville, Ky.; (Junior, 1940R48).

O'Brien, D. E., Asst. Reservoir Mgr., Corps of Engr., U. S. Army, Nashville, Tenn.; Oregon State, B.S.F., 1937. (Junior, 1941 R47).

Rhody, J. P., Dist. Forester, Ky. Div. of Forestry, Dawson Springs, Ky.; Iowa State, B.S.F., 1940. (Junior, 1947).

New England Section

Junior Grade

Gardner, N. B., Forester, Forestry and Recreation Comm., Concord, N. H.; Principia College, B.A., 1938; Yale, M.F., 1950.

Hannon, L. P., 109 Grandview Ave., Worcester, Mass.; Univ. of Mass., B.S.F., 1949; Univ. of Mich., M.F., 1951.

Miniutti, V. P., Radio Operator, Pluswood Inc., Oshkosh, Wis.; Univ. of Me., B.S.F., 1942; Yale, M.F., 1947.

Wing, M. R., Woods Supt., International Paper Co., Ashland, Me.; Univ. of Me., B.S.F., 1942.

Member Grade

Andersen, H. E., Grad. Student, Yale, New Haven, Conn.; Univ. of Wash., B.S.F., 1941. (Junior, 1947).

Call, F. M., Consulting Forester, J. W. Sewall Co., Old Town, Me. (Junior, 1947).

Maines, J. T., Buyer and Supt., Great Northern Paper Co., Bangor, Me.; Univ. of Me., B.S.F., 1940. (Junior, 1947).

Merrill, J. H., Woods Mgr., Anglo Canadian Pulp and Paper Mills Ltd., Quebec, Can.; Univ. of Me., B.S.F., 1924. Reinstatement.

Place, I. C. M., Silvic., Dominion Forestry Branch, Fredericton, N.B., Can.; Univ. of N.B., B.S., (Forestry), 1940; Yale, M.F., 1947. (Junior, 1947).

Strout, D. F., Forester, International Paper Co., North Stratford, N. H.; Univ. of Me., B.S.F., 1939. (Junior, 1947).

Affiliate Grade

Fraser, A. F., Forest Engr., Spartan Air Services Ltd., Ottawa, Ontario, Can.; Univ. of N.B., B.S.F.E., 1949.

New York Section

Junior Grade

Bayless, B. J., Jr. Forester, N. Y. State Cons. Dept., Lake George, N. Y.; N. Y. State, B.S.F., 1950.

Chabbott, G. H., Jay, N. Y.; Utah State, B.S.F., 1950.

Engel, E. J., 2446 Creston Ave., New York, N. Y.; N. C. State, B.S.F., 1950.

Fitch, H. E., Pole Pre-inspector, Osmose Wood Preserving Co., Buffalo, N. Y.; Mich. State, B.S.F., 1950.

Hagar, R. K., Tech. Asst., N. Y. State, College of Forestry, Syracuse, N. Y.; N. Y. State, B.S.F., 1950.

Member Grade

Rushmore, F. M., Research Forester, Paul Smiths Exp. Forest, Paul Smiths, N. Y.; Pa. State, B.S.F., 1939. (Junior, 1945).

Stout, N. J., Tech. Asst., N. Y. State, College of Forestry, Syracuse, N. Y.; N. Y. State, B.S.F., 1942. (Junior, 1947).

Affiliate Grade

MacPherson, G. A., Sr., Jr. Engr., N. Y. State Thurway, Buffalo, N. Y. Reinstatement.

Northern California Section

Junior Grade

Babbitt, D. S., Forestry Aide, U.S.F.S., Adin, Calif.; Mich. State, B.S.F., 1948.

England, C. D., Jr. Forester, Masonite Corp., Ukiah, Calif.; Univ. of Calif., B.S.F., 1949.

Olson, N. I., Compassman Asst., Dean Solinsky, Mokelumne Hill, Calif; Univ. of Wash., B. S. F., 1950.

Sweeley, J. P., Jr. Forester, Masonite Corp., Ukiah, Calif.; Univ. of Calif., B.S.F., 1950.

Member Grade

Arnold, H. L., Assoc. State Forest Rgr., Calif. State Div. of Forestry, Mariposa, Calif.; Colo. A. & M., B.S.F., 1938. (Junior, 1948).

Beaty, W. R. C., Asst. Dist. Rgr., U.S.F.S., Susanville, Calif.; Univ. of Calif., B.S.F., 1940. (Junior, 1947).

Clifton, T. C., Forester, U.S.F.S., Fall River Mills, Calif.; Oregon State, B.S.F., 1942. (Junior, 1946).

Ray, G. J., Forest Tech., State of Calif., Mendocino, Calif.; Univ. of Calif., B.S.F., 1941. (Junior, 1948).

Affiliate Grade

Ingram, O. A., Asst. State Forest Rgr., Calif. State Div. of Forestry, Fresno, Calif.

Northern Rocky Mountain Section

Junior Grade

Corrick, E. B., Thr. Cruiser, Anaconda Copper Mining Co., Bonner, Mont.; State, B.S.F., 1948.

Dawson, A. L., Thr. Cruiser, Anaconda Copper Mining Co., Bonner, Mont.; Mont. State, B.S., F. 1950.

Gill, J. M., Shipping Dept., J. Neils Lbr. Co., Libby, Mont.; Iowa State, B.S.F., 1950.

McKinsey, R. A., Logging Engr., Mont. Tbr. Co., Missoula, Mont.; Mont. State, B.S.F., 1949.

Member Grade

Billings, S. T., Dist. Rgr., U.S.F.S., Darby, Mont. (Junior, 1947).
Rogers, J. L., Asst. Rgr., U.S.F.S., Helena, Mont.; Colo. A & M., B.S.F., 1943; M.F., 1947. (Junior, 1947).
Scott, D. R. M., Research Forester, Dept. of Resources and Development, Calgary, Alberta, Can.; Univ. of Va., B.A., 1942; Yale, M.F., 1947; Ph.D., 1950. (Junior, 1947).
Smart, R. A., Dist. Forest Rgr., U.S.F.S., Huson, Mont.; Univ. of N. H., B.S.F., 1937. (Junior, 1946).
Moore, K. E., Instructor, Mont. State Univ., Missoula, Mont.; Conn. State, B. S., 1934. (Junior, 1935).

Ozark Section

Member Grade

Bruce, R. I., Dist. Forester, Crossett Lbr. Co., Crossett, Ark.; Yale, B.S., 1941; M.F., 1947. (Junior, 1947).
Fletcher, P. W., Assoc. Prof. of Forestry, Univ. of Mo., Columbia, Mo.; Pa. State, B.S.F., 1933 Reinstatement
Hartrick, G. D., Dist. Forester, Crossett Lbr. Co., Crossett, Ark.; Univ. of Mich., B.S.F., 1940; M.F., 1941. (Junior, 1946).

Affiliate Grade

Gotcher, J. T., Farm Forester, State Forestry Div., Chickasha, Okla.; Okla. A & M., B.S., (Forestry), 1950.
Kurz, J. G., Block Forester, John Burwell, Broken Bow, Okla.; Okla. A. & M., B.S., (Forestry), 1950.

Puget Sound Section

Junior Grade

Hadacek, A. F., Asst. Dist. Forest Warden, Wash. State Div. of Forestry, Chehalis, Wash.; Iowa State, B.S.F., 1950.

Member Grade

Chester, C. E., Forester, U. S. Indian Service, Toppenish, Wash.; Oregon State, B.S.L.E., 1934. (Junior, 1935R47).
Gessel, S. P., Instructor, College of Forestry, Univ. of Wash., Seattle, Wash.; Utah State, B.S.F., 1939; Univ. of Calif., Ph.D., 1948. (Junior, 1946).
Guyon, D. A., Inventory-Utilization Forester, Weyerhaeuser Tbr. Co., Chehalis, Wash.; Mich. State, B.S.F., 1947. (Junior, 1948).
Hopkins, D. R., Asst. Supv., State Div. of Forestry, Olympia, Wash.; Univ. of Wash., B.S.F., 1939. (Junior, 1945).
Mathers, W. G., Agric. Research Officer, Dom. Forest Insect Lab., Vernon, B. C., Can.; Univ. of B.C., B.S.A., 1923; N. Y. State, M.S., 1931. (Junior, 1944).
Maycock, C. P., Forester, U. S. F. S., Sitka, Alaska; Utah State, B.S.F., 1946. (Junior, 1949).
McCullough, R. N., Dist. Rgr., U.S.F.S., Snoqualmie, Wash.; (Junior, 1946).
Newman, S. A., Forest Engr., Box 156, Everett, Wash.; N. Y. State, B.S.F., 1939. (Junior, 1946).
Ridgeway, J. W., Dist. Forest Warden, State Div. of Forestry, North Bend, Wash.; Univ. of Wash., B.S.F., 1938. (Junior, 1947).
Robinson, J. C., Asst. Wood Buyer, Everett Pulp and Paper Co., Everett, Wash.; Pa. State, B.S.F., 1939. (Junior, 1949).
Rochelle, E. B., Dist. Forest Warden, State Div. of Forestry, Omak, Wash.; Univ. of Wash., B.S.F., 1939. (Junior, 1946).
Shaw, E. W., Forester, Pac. N. W. Forest and Range Exp. Sta., Olympia, Wash.; Purdue, B. S. F., 1941; Univ. of Calif., M.F., 1947. (Junior, 1947).
Skarra, P. E., Supt., Bur. of Indian Affairs, Toppenish, Wash.; Univ. of Minn., B.S.F., 1938. (Junior, 1947).
Yocom, T. R., Resident Forester, Weyerhaeuser Tbr. Co., Monroe, Wash.; Iowa State, B.S.F., 1941. (Junior, 1947).

Southeastern Section

Junior Grade

Bailey, H. B., Jr., 351 Broad St., Augusta, Ga., Univ. of Ga., B.S.F., 1950.
Beall, J. W., Veterans Agri. Teacher, Ala. State Dept. of Education, Scottsboro, Ala.; Ala. Poly. Inst., B.S.F., 1949.
Branyan, W. C., Georgetown, Ga., Univ. of Ga., B.S.F., 1950.
Branyan, Y. C., Georgetown, Ga., Univ. of Ga., B.S.F., 1950.
Brightwell, C. N., 2402 18th Ave., Columbus, Ga., Univ. of Ga., B.S.F., 1950.
Brown, C. W., Asst. Forester, Kaul Lbr. Co., Sylacauga, Ala.; Ala. Poly. Inst., B.S.F., 1948.
Bullock, W. R., Jr., Forester, Murphy Corp., El Dorado, Ark.; Ala. Poly. Inst., B.S.F., 1949.
Byrd, N. A., 93 College St., Ozark, Ala.; Ala. Poly. Inst., B.S.F., 1950.
Carlson, B. D., Dist. Forester, Coosa River Newsprint Co., Dadeville, Ala.; Ala. Poly. Inst., B.S.F., 1949.
Creighton, D. G., 712 Brookline St., S.W., Atlanta, Ga.; Univ. of Ga., B.S.F., 1950.
Crenshaw, M. E., 740 Virginia Circle, Atlanta, Ga.; Univ. of Ga., B.S.F., 1950.
Davis, W. H., Concord, Ga., Univ. of Ga. B.S.F., 1950.
Dellinger, J. C., 1310 Albermarle St., Brunswick, Ga., Univ. of Ga., B.S.F., 1950.
Evans, W. B., Jr., Ga. State College, Americus, Ga.; Univ. of Ga.; B.S.F., 1950.
Hancock, J. H., 713 McKoy St., Decatur, Ga.; Univ. of Ga., B.S.F., 1950.
Hix, S. P., Ga. Forestry Comm., Barnesville, Ga.; Univ. of Ga., B.S.F., 1950.
Hughes, D. C., Box 650, Birmingham, Ala.; Ala. Poly. Inst., B.S.F., 1950.
Kelly, T. H., Jr., Jr. Forester, Alger-Sullivan Lbr. Co., Century, Fla.; Ala. Poly. Inst., B.S.F., 1949.
Kinchen, R. E., 2024 Reynolds St., Brunswick, Ga.; Univ. of Ga., B.S.F., 1950.
Martin, C. H., Jr., 1920 Reynolds St., Brunswick, Ga.; Univ. of Ga., B.S.F., 1951.
Moore, E. O., Box 56, Dadeville, Ala.; Ala. Poly. Inst., B.S.F., 1949.
Nelson, W.R., 420 Howell St., Thomaston, Ga.; Univ. of Ga., B.S.F., 1950.
Randall, W. R., Washington, Ga.; Univ. of Ga., B.S.F., 1950.
Reddish, V. R., Box 100, Odum, Ga.; Univ. of Ga., B.S.F., 1950.
Riley, O. L., Asst. Forester, The Berry Schools, Mt. Berry, Ga.; Univ. of Ga., B.S.F., 1949.
Smith, J. E., 3312 Ave. H., Birmingham, Ala.; Ala. Poly. Inst., B.S.F., 1950.

Southern California Section

Junior Grade

Hass, G. E., 4156 Locust St., Riverside, Calif.; Mich. State, B.S.A., 1950.

Southwestern Section

Junior Grade

Engstrom, G. E., Box 542, Taos, N. Mex.; Colo. A & M., B.S.F., 1933. Reinstatement.

Member Grade

Greco, V. A., Supv's. staff, U.S.F.S., Silver City, N. Mex.; Univ. of Idaho, B.S.F., 1937. (Junior, 1947).
Hill, L. O., Dist. Forest Rgr., U.S.F.S., Jemez Springs, N. Mex.; Univ. of Minn., B.S.F., 1933. (Junior, 1946).
Watkins, A., Forester, U.S.F.S., Albuquerque, N. Mex.; Oberlin College, A.B., 1930; Tulane Univ., M.S., 1934. (Junior, 1945).
Wilton, E. W., Dist. Forest Rgr., U.S.F.S., Tres Piedras, N. Mex.; Mich. State, B.S.F., 1940. (Junior, 1947).

Upper Mississippi Valley Section

Junior Grade

Rozeboom, W. B., 1414 Main St., Rock Valley, Iowa; Iowa State, B.S.F., 1950.
Soderling, D. E., 308 Hill, Dubuque, Iowa; Iowa State, B.S.F., 1950.

Member Grade

Gannaway, J. C., Forester, Minn. Div. of Forestry, St. Paul, Minn. (Junior, 1947).
Guilkey, P. C., Forester, U.S.F.S., St. Paul, Minn.; Mich. State, B.S.F., 1943; M.F., 1946. (Junior, 1947).
Halligan, J. V., Sales Repre., Winton Lbr. Sales Co., Minneapolis, Minn.; Univ. of Mich., B.S.F., 1940; M.F., 1946. (Junior, 1945).
Licke, J. N., Dist. Leader, Blister Rust Control, U.S.D.A., Walker, Minn.; Univ. of Minn., B.S.F., 1935. (Affiliate, 1937, Junior, 1947).
Matson, R., Land Appraiser, Minn. Dept. of Cons., Bemidji, Minn.; Univ. of Minn., B.S.F., 1935. (Junior, 1948).
Molberg, J. M., Assoc. State Forester, N. Dakota School of Forestry, Bottineau, N. Dak., Univ. of Idaho, B.S.F., 1939. (Junior, 1946).
Nelson, R. F., Corp., Pres., Forestry Enterprises, Inc., St. Paul, Minn.; Univ. of Minn., B.S., 1943; M.F., 1948. (Junior, 1947).
Rommel, S. S., Forester, Minn. Dept. of Cons., Effie, Minn. (Junior, 1945).
Rowson, L., Forester Iron Range Resources and Rehabilitation, St. Paul Minn.; Univ. of Minn., B.S.F., 1947. (Junior, 1949).
Thompson, G. W., Instructor, Iowa State College, Ames, Iowa; Iowa State, B.S.F., 1943; M.F., 1947. (Junior, 1946).
Uxenik, F. A., Forester, Minn. Forest Service, Warroad, Minn.; Univ. of Minn., B.S.F., 1940. (Junior, 1947).
West, W. E., Forester, Div. of Forestry, State of Minn., Blackduck, Minn.; Univ. of Minn., B.S.F., 1940. (Junior, 1947).

Associate Grade

Bennett, H. D., Exec.-Sec., Keep Minnesota Green, St. Paul, Minn.; Conn. State, B.A., 1920.

Washington Section

Junior Grade

Forsyth, E. W., Cartographic Aide, Army Map Service, Washington, D. C.; Univ. of Me., B.S.F., 1946.

Member Grade

Quillinan, A. R., Forester, U.S.F.S., Washington, D. C.; Cornell Univ., B.S.F., 1925. (Junior, 1935R51).

Wisconsin-Upper Michigan Section

Junior Grade

Jordahl, H. C., Jr., Dist. Game Mgr., Wis. Cons. Dept., Black River Falls, Wis.; Univ. of Mich., B.S.F., 1950; M.F., 1950.
Moore, L. C., Laborer, Kimberly Clark Corp., Norway, Mich.; Mont. State, B.S.F., 1950.
Rausch, T.J., 854 N. 24th St., Milwaukee, Wis.; Mich. State, B.S.F., 1950.

Member Grade

Nixon, H. O., Dist. Rgr., U.S.F.S., Florence, Wisc.; Univ. of Mich., B.S.F., 1936; M.F., 1946. (Junior, 1946).

Affiliate Grade

Porter, W. A., Grad. Stud., Univ. of Wis., Madison, Wis.; Univ. of B. C., B.S., (Forestry), 1949; Univ. of Wis., M.S., 1950.

Foreign

Junior Grade

Harris, R. C., P. O. Box 1697, Balboa, Canal Zone; Utah State, B.S.F., 1950.

Corresponding Grade

Ito, Mitsugu, Asst. Prof. of Forestry, Normal College, Gifu Univ., Japan.

Candidates Elected

The following persons were elected to the indicated grades of membership by the Council on February 1, 1951.

Junior Grade

Anderson, L. E.
Basel, C. O.
Berndt, H. E.
Black, E. D.
Callaham, R. Z.
Craft, E. J.
Darrach, A. G.
Dickhaus, R. V.
Dixon, H. S. (re)
Ebnet, J. M.
Furniss, M. M.
Glunt, T. E.
Gossard, J. C.
Hoag, C. A
Holland, J. C.
Hunter, D. B.
Jacobson, W. T.
Jameson, D. E.
Johnson, D. L.
Kageorge, M. W.
Kingston, J. T.
Lamb, A. J.
Lausch, B. A.
LeBlanc, W. J.
Lindahl, R. R.
Lockett, T
McDonald, T.
Miller, C. H.
Mountser, R. W.
Nelson, J. A.
Ogletree, W. T.
Olson, C. H.
Perkins, P. C.
Reiske, R. F.
Reynolds, R.
Ringold, G. B.
Roye, A. O.
Schmidt, F. F.
Schori, M. O.
Scott, E. L.
Smith, E. A.
Spurgeon, S. E.
Stephens, V. (re)
Stevens, M. J.
Warman, D. A.
Weeks, R. H.
Wood H. J.
Young, G. E.

Member Grade

Abbott, H. G.
Argetsinger, L. M.
Benson, R. W.
Bourdo, E. A.
Buckland, D. C.
Buescher, P. P.
Bush, H. H.
Coutant, S. E.
Dedeaux, R. J.
Dosen, R. C.
Farrell, J. H.
Fender, D. E.
Flick, F. J.
Fulton, L. R.
George, L. E.
Harrison, J. D. B.
Hult, G. W. (re)
Jones, M. S.
Kaufner, H. B.
Kreutzer, W. R. (re)
Logan, B. A.
Martin, J. V.
Marts, R. O.
McKnight, J. S.
Merritt, C.
Mullin, R. E.
Pendleton, R. E.
Phillips, J. E.
Rand, C. W.
Ritchie, J. I.
Robertson, C. W.
Schubert, G. H.
Smith, D. M.
Stevens, C. W.
Stock, J. W.
Swanson, A. L.
Tribbett, V. A.
Upton, N. W.
VonDahlen, M.
Weatherly, J. E.
Welsh, S. W.
Williams, R. B.
Zabel, R. A.

Affiliate Grade

Beck, C. A.
Frazier, F. O.
Gorence, J.
Keaton, G. E.
Leerssen, O. F.
Tarbell, R. C.

Associate Grade

Gruen, E. D.

Corresponding Grade

Badran, O. A. Moilanen, T.

New Members and Advancements

The new members and members advanced in grade who are listed below are eligible for participation in activities of the Society of American Foresters, including the meetings and projects of Sections, Chapters, Divisions, and Committees. They have submitted their applications for membership, properly endorsed, and have been declared eligible by the Council. By accepting election, these members have indicated their desire to assist the Society in the fulfillment of its objectives.

Allegheny Section

Junior Grade

Armstrong, R. C., 2 Second Ave., Warren, Pa.
Hanna, W. H., Franklin Village, Morristown, N. J.
Judd, H. P., Gibsonia, Pa.
Keller, W. C., Standing Stone Exp. Forest, Huntingdon, Pa.
Parker, R. W., Maidsville, W. Va.

Appalachian Section

Junior Grade

Anderson, R. F., Duke Univ., Durham, N. C.
Cavanaugh, M. J., 303 Brattan St., Winnsboro, S. C.
Collicott, L. V., 114 Winyah Rd., Georgetown, S. C.
Ince, G. A., 2232 Cranford Rd., Durham, N. C.
Millers, A. W., 705 1st Ave., Lawrenceville, Va.
Ralston, J., State College Sta., Raleigh, N. C.
Ratliff, W. S. 981 N. Blvd., Orangeburg, S. C.
Ray, P. L., Duke Sta., Durham, N. C.
Searcy, W. H., Waverly, Va.
Whitt, T. W., Box 222 Waverly, Va.

Member Grade

Wood, R. A., 18 Buckingham Ct., Asheville, N. C.

Central States Section

Junior Grade

Cech, G. O., 2322 N. 77th Ave., Elmwood Park, Ill.
Venema, W. J., 1037 Birch Rd., E. Lansing, Mich.
Wilson, R. M., 823 Stewart Ave., Cambridge, Ohio

Member Grade

Beckert, W. M., Dept. of Cons., Jackson, Mich.

Columbia River Section

Junior Grade

Forrest, J. S., Box 105, Wecoma, Oreg.
Herstine, R. B., 5525 N. Campbell Ave., Portland, Oreg.

Gulf States Section

Junior Grade

Hallberg, R. K., Box 173, Lufkin, Tex.
Hammarstrom, C., Box 137, Bude, Miss.
Pettey, J. R., 213 Princeton St., Jackson, Miss.
Wilkinson, J. M., Jr., Lauderdale, Miss.

Member Grade

Sample, L. A., Box 225, Shreveport, La.

Associate Grade

Legett, A. A., Box 649, Jackson, Miss.

Inland Empire Section

Junior Grade

Spencer, R. W., 717 3rd Ave., Coeur d'Alene, Idaho

Kentucky-Tennessee Section

Junior Grade

Grafton, C. F., 707 Dermon Bldg., Memphis, Tenn.

New England Section

Junior Grade

Gabriel, W. J., 572 Washington St., Wellesley, Mass.
Sheffield, H. S., Box 319, Woodmont, Conn.
Shepard, H. M., Eastern Pulp Wood Co., Calais, Me.

New York Section

Junior Grade

Beckman, J. H., Soundview Ave., White Plains, N. Y.
Davey, C. B., 117 Conrad Drive, Rochester 16, N. Y.
Ellis, C. W., 565 W. 181 St., New York, N. Y.
Peterson, D. E., 70 Bloomingdale Ave., Saranac Lake, N. Y.

Northern California Section

Junior Grade

Patterson, H. E., 3208 Albee St., Eureka, Calif.
Sanford, W. M., 932 Hilldale Ave., Berkeley, Calif.

Northern Rocky Mountain

Junior Grade

Slusher, E. C., 116 N. 22nd St., Billings, Mont.

Ozark Section

Junior Grade

Wilson, J. S., 503 W. Leslie Rd., Nashville, Ark.

Southeastern Section

Junior Grade

Calhoun, J. C., 1801 Carr St., Palatka, Fla.
Cox, R. L., 109 College St., Valdosta, Ga.
Crews, A. C., 2204 Forest St., Savannah, Ga.
Eadie, F. H., 850 Penn Ave., Atlanta, Ga.
Einspahr, D. W., 115 Oak Forest Drive, Montgomery, Ala.
Henson, J. A., Box 422, Swainsboro, Ga.
Lisenby, W. E., Soperton, Ga.
Stevens, W., U.S.F.S., Atlanta, Ga.

Southern California Section

Junior Grade

Norman, R. H., 2123 Norwalk Ave., Los Angeles, Calif.

Upper Mississippi Valley Section

Junior Grade

Gallaher, W. B., Fayette, Iowa
Stokes, J. M., S.C.S., Anamosa, Iowa
Vandershule, T. D., 912 Pammel Ct., Ames, Iowa

Wisconsin-Upper Michigan Section

Junior Grade

Pepper, A. A., Jr., 255 Paddock Ave., Park Falls, Wis.

Names Dropped From Membership Roll

Below are the names of all persons whose membership in the Society terminated during calendar year 1950.

Deceased

Fellow Grade

Baker, Hugh P., Winter Park, Fla.
Cheyney, E. G., Apalachicola, Fla.

Member Grade

Averill, Walter, Middlebury, Vt.
Beck, Donald W., Albuquerque, N. M.
Betensen, Blaine, Richfield, Utah
Cope, Joshua A., Ithaca, N. Y.
Douthitt, Robert H., Greagle, Calif.
Dunham, Wm. E., Ridgeland, S. C.
Foxworthy, Fred W., Berkeley, Calif.
Gaskill, Alfred, Brandon, Vt.
Hawes, Norman E., Narberth, Pa.
Kelleter, Paul D., Columbia, Mo.
Kline, L. V., Norris, Tenn.
McCanlies, Preston H., Seneca, Ore.
Peabody, Joseph L., Wayland, Mass.
Prichard, R. P., Syracuse, N. Y.
Rice, W. B., Ogden, Utah
Stahl, C. J., Denver, Colo.
Switzer, Harry D., Murphysboro, Ill.
Thomson, Roy B., Durham, N. C.

Junior Grade

Baker, John Wm., Korbel, Calif.
Lauridson, Donald G., Meeker, Colo.

Affiliate Grade

Sarles, Henry U., Lakeview, Ore.
Williams, Clarence C., Klamath Falls, Ore.

Associate Grade

Cornwall, George M., Berkeley, Calif.

Corresponding Grade

Jonson, Tor Wm., Djursholm, Sweden
Story, Fraser, London, England

Honorary Grade

Antoni, M. Paul, Paris, France

Resigned in Good Standing

Member Grade

Allen, Herbert S., Bridgton, Maine
Anderson, Rolfe E., Hebo, Ore.
Auten, John T., Columbus, Ohio
Bacon, Frederick W., San Francisco, Calif.
Bailey, Harrison V., Alexandria, Va.
Bard, G. P., Reading, Pa.
Bauer, Donald R., Idyllwild, Calif.
Branagh, Henry Edward, King City, Calif.
Callinan, Harry T., Davenport, Iowa
Corson, C. W., San Francisco, Calif.
Cranch, Richard C., Norwalk, Conn.
Downs, Albert, Washington, D. C.
Durham, Marion W., Pasadena, Calif.
Ellstrom, Raymond W., Prineville, Ore.
Elofson, Harry W., Wenatchee, Wash.
Fetzer, Carl D., Elizabeth City, N. C.
Fields, Ralph E., Missoula, Mont.
Fletcher, Peter W., Columbia, Mo.
Forsaith, C. C., Auburn, N. H.
Fowler, O. E., Sacramento, Calif.
Freydig, Paul E., Eureka, Calif.
Fuller, Francis S., Essex, Mass.
Furbush, Paul B., Forestville, Calif.
Gangle, Lawrence C., Coos Bay, Ore.
Gardiner, Thomas B., Arlington, Va.
Gray, John L., Sonora, Calif.
Grogan, William W., Puyallup, Wash.
Hansen, Q. David, Moab, Utah
Hawley, L. F., Madison, Wis.
Hazen, J. Frederick, Severna Park, Md.
Henderson, Carl F., Grand Junction, Colo.
Hill, Wilson, O., Pittsfield, Mass.
Hughes, H. R., Colibran, Colo.
Hume, John F., Headquarters, Idaho
Kagetsu, Hajime, Port Arthur, Ont., Canada
Koski, Onni O., International Falls, Minn.
Kowal, R. Joseph, Gulfport, Miss.
Larsson, Paul R., Harrisburg, Ill.
Lauer, Wilfred H., Jr., Winona, Minn.
Leidman, Louis, Jr., Luna, N. M.
Maki, Kalervo, Arlington, Va.
Mason, Earl G., Albany, Ore.
May, Richard H., Berkeley, Calif.
McCowan, T. F., Norwich, N. Y.
McKennan, R. B., Colorado Springs, Colo.
Merrill, Julian H., Nipigon, Ont., Canada
Miller, Elmer E., Colorado Springs, Colo.
Miller, R. B., Eagle Harbor, Mich.
Miller, Robert M., Berkeley, Calif.
Mitchell, Glenn E., Portland, Ore.
Moore, Francis I., Grand Rapids, Minn.
Moore, Frank S., Hailey, Idaho
Newcomb, Paul S., Cadillac, Mich.
Norris, Norman L., Porterville, Calif.
O'Byrne, J. W., Blacksburg, Va.
Pearson, Clifford H., Olympia, Wash.
Putsch, Llewellyn J., Albuquerque, N. M.
Ricard, Richard, Norris, Tenn.
Rickel, L. A., Santa Barbara, Calif.
Riley, James E., Jr., Hamden, Conn.
Rouse, Charles H., Lakeview, Ore.
Rowland, Charles A., Jr., Athens, Ga.
Saterbor, Bernt C., North Bend, Wash.
Schaville, Joseph P., Des Plaines, Ill.
Sebring, H. M., McRae, Ga.
Small, Laurence T., Rockville, Conn.
Stillinger, C. R., Moscow, Idaho
Whitehill, Benjamin M., Meeker, Colo.
Wilcox, Ralph F., Indianapolis, Ind.
Wright, Edward, Durange, Colo.

Junior Grade

Anderson, R. C., Ogden, Utah
Andre, Harvey J., Cleveland, Ohio
Atkins, John D., Jr., Falls Church, Va.
Barton, Orville C., Jr., Fort Collins, Colo.
Beard, Fred, Jr., Worcester, Mass.
Berkenkamp, Eugene H., St. Lucia, Windward Islands
Blake, John W., El Paso, Tex.
Briscoe, C. B., Sicily Island, La.
Bush, Benjamin R., Fort Leavenworth, Kan.
Bussey, James Phillips, Wis.
Callin, Charles S., Glendale, Calif.
Campbell, Bernard T., Roanoke, Va.
Capuder, Frederick C., Lawrencesberg, Ind.
Chaney, Richard W., Berkeley, Calif.
Cowles, Donald H., Fort Riley, Kan.
DeGroote, Lawrence W., Seattle, Wash.
DeSellem, Charles W., Denver, Colo.
Douglas, Gordon A., Greeley, Colo.
Duckett, Henry E., Jr., Montpelier, Vt.
Eddy, Frank C., Jr., DeWitt, Ark.
Empie, Jay A., Superior, Wis.
Etzel, Edward F., East Haven, Conn.
Ficke, Herman O., Avery, Idaho
Frosali, Mario, Los Angeles, Calif.
Fyock, Ira J., Tucson, Ariz.
Galey, Carl D., Ottumwa, Iowa
Geerds, Harry J., Seattle, Wash.
Gilbert, Adrian M., Upper Darby, Pa.

Gillett, George W., Bakersfield, Calif.
Goldberg, Joe, Albuquerque, N. M.
Goodheart, William J., Hilcrest Heights, Md.
Green, F. K., Lakewood, Wis.
Gresh, Walter A., Atlanta, Ga.
Griffin, Erastus P., Jr., Philadelphia, Pa.
Gross, Edward A., Berkeley, Calif.
Guild, Eugene R., Glenwood Springs, Colo.
Gurr, J. Boyd, Salt Lake City, Utah
Gustafson, Chalmer W., St. Regis, Mont.
Guthrie, Mike, Deer River, Minn.
Hampton, John, Lake Butler, Fla.
Harris, M. R., Pullman, Wash.
Hayman, Merton F., Hood River, Ore.
Hays, Robert S., Canby, Calif.
Hickel, Manford R., Beulah, Colo.
Hill, George R., Chicago, Ill.
Houghland, Lloyd L., Colville, Wash.
Husman, Donald, Washington, D. C.
Johnson, Carl M., Camp Lejeune, N. C.
Johnson, Peter H., Denver, Colo.
Kaye, John P., New York, N. Y.
Kjosness, John O., Eugene, Ore.
Leach, Daniel, Washington, D. C.
MacLaren, James P., San Francisco, Calif.
Magelssen, Magnus W., Stanwood, Wash.
Mangan, Albert F., Oneida, N. Y.
Manges, D. Edmund, Norris, Tenn.
Marshall, William H., St. Paul, Minn.
Maus, Calvin D., Salem, Ore.
O'Neil, Gerald J., LaCrosse, Wis.
Overby, James F., Marble Rock, Iowa
Porter, Clarence E., Scarsdale, N. Y.
Ramey, David E., Towson, Md.
Reines, Mervin, State College, Pa.
Rifenberg, Wayne A., Grand Rapids, Mich.
Rosetta, Noel E., Rock Spring, Wyo.
Runkel, Sylvan T., Story City, Iowa
Sargeant, Howard J., Tulelake, Calif.
Schmitt, Theodore J., Columbus, Ohio.
Schuett, Frederick H., China Lake, Calif.
Skyles, Richard K., Portland, Ore.
Smith, Frank J., Delta, Colo.
Taylor, Stanley A., Seattle, Wash.
Tobey, F. L., Eugene, Ore.
Wait, Hershey L., Chicago, Ill.
Walling, Willoughby H., Santa Fe, N. M.
Warden, Harold V., Fort Collins, Colo.
Watson, LeRoy W., Jr., Atlanta, Ga.
Welker, Joseph, Jacksonville, Fla.
Wissen, George G., Ithaca, N. Y.
Wright, Cordner C., Kapuskasing, Ont., Canada
Zauche, W. Frederick, Jr., Salt Lake City, Utah
Zimmerman, Eliot W., Laona, Wis.

Affiliate Grade

Backus, Henry G., Jesup, Ga.

Associate Grade

Desumer, T. O., Bluefield, W. Va.
Taylor, Walter P., Stillwater, Okla.

Resigned in Arrears

Member Grade

Burka, George F., Berkeley, Calif.
Heminway, Rowland F., Harrisonburg, Va.
Kinney, John N., Ogden, Utah
Schmidley, Francis X., Southern Pines, N. C.
Smith, V. D., Tucson, Ariz.
Standtmiller, Louis R., Asheville, N. C.
Towne, Charles R., Delta, Colo.

Junior Grade

Aiken, Maxwell John, Springfield, Ore.
Anderson, Ross L., Chicago, Ill.
Cassidy, M. W., Jr., Kaukauna, Wis.
Corpening, Charles D., Kirkwood, Mo.
Dolezel, Albert C., Sacramento, Calif.
Godson, Lindley W., Colonia, N. J.
Hamps, Philip R., Salem, Ore.
Jack, Charles L., Signal Mountain, Tenn.
Kintigh, Robert G., Eugene, Ore.
Leecklider, G. Robert, Corvallis, Ore.
Lotz, Arthur W., Monrovia, Liberia, West Africa
Mathieu, Theodore F., North Amherst, Mass.
Noack, William O., Sacramento, Calif.
Reynolds, Charles E., Portland, Ore.
Rodarmel, John R., Seattle, Wash.

Affiliate Grade

Hendrickson, Marvin A., Park Rapids, Minn.

Dropped for Non-Payment of Dues

Member Grade

Allen, Henry V., Jr., Flagstaff, Ariz.
Bacon, Russell S., Willows, Calif.
Been, Frank T., McKinley Park, Alaska
Berry, Jack S., Camino, Calif.
Bixby, Thomas P., Ellis, Kan.
Blake, Clyde D., Missoula, Mont.
Brainard, William H., Las Vegas, N. M.
Brentlinger, Paul D., Philadelphia, Pa.
Brown, C. T., Jr., Stockbridge, Vt.
Bruner, E. Murray, Louisville, Ky.
Burgess, R. C., Baker, Ore.
Carlson, Conrad W., Glidden, Wis.
Clemens, Roger C., Alameda, Calif.
Dayharsh, Victor J., Ironwood, Mich.
Dercum, Max, Dillon, Colo.
Drumheller, Daniel R., Farmville, Va.
Goodyear, H. E., Weaverville, Calif.
Gorsuch, George S., Douglas, Wyo.
Grabow, Rudolph H., Bedford, Ind.
Hairr, Leland B., Marion, N. C.
Hathhorn, Jesse, Montague, Mich.
Heberling, Ralph B., Spartanburg, S. C.
Hedden, George W., Washington, D. C.
Kuhns, John C., Oswego, Ore.
Land, F. A., Sierraville, Calif.
Lary, George A., Little Rock, Ark.
Luken, Stanley M., Missoula, Mont.
Mathews, John T., McCall, Idaho
MacDonald, James C., New Gretna, N. J.
McKellar, A. D., Fairfax, Va.
McLeod, Kenneth, Klamath Falls, Ore.
Mitchell, J. Roy, Okanogan, Wash.
Moore, Irving H., Winner, S. Dak.
Morris, Melvin S., Missoula, Mont.
Mosely, George W., Jacksonville, Fla.
Oren, Eugene A., Spartanburg, S. C.
Peevy, Orion J., New Bern, N. C.
Price, Harold H., Ogden, Utah
Ramstad, George L., Pine Grove, Calif.
Rankin, Duncan G., Albany, N. Y.
Robe, Harvey O., Gunnison, Colo.
Scherer, Norman W., Minneapolis, Minn.
Smith, Walter P., Norris, Tenn.
Stageiman, Howard, Fort Collins, Colo.
Terrell, Charles L., Fort Collins, Colo.
Thatcher, Donald M., Denver, Colo.
Tiedeman, Henry, Winter Park, Colo.
Tolle, Siegfried W., Pownal, Vt.
Vanden Oever, E. H., Seattle, Wash.
Viche, Henry J., Sandpoint, Idaho
Vincent, Paul Y., Lufkin, Tex.
Vogelsang, Phelps, Midland, Mich.
Wiggin, Gilbert H., Borger, Tex.
Willets, Robert T., Brownfield, Maine

Junior Grade

Abrahams, Bernard J., Colorado Springs, Colo.
Affolter, Paul, Pekin, Ill.
Anderson, Allan E., Hampton, S. C.
Anderson, Richard H., White Plains, N. Y.
Arnason, Allan T., Spokane, Wash.
Baird, John C., Monte Vista, Colo.
Banasiak, Chester F., Amherst, Mass.
Barber, Philip E., Saratoga Springs, N. Y.
Barnett, John, Jr., Clinton, La.
Barney, Philip C., Farmington, Conn.
Beebe, Robert R., Havertown, Pa.
Boatman, Robert L. Van Wert, Iowa
Boutin, Fernand, Quebec, Canada
Bower, Kenneth G., Fillmore, Utah
Brogan, Philip D., Salem, Ore.
Buck, Robert J., Miami, Fla.
Charlton, John W., Gloversville, N. Y.
Cook, H. C. Freeman, Gatun, Canal Zone
Corey, Robert A., Modesto, Calif.
Cross, Kenneth J., Buffalo, Wyo.
Crowe, C. V., Pasadena, Calif.
Dickson, Bly, Dayton, Wyo.
Djerf, Harvey E., Minneapolis, Minn.
Drahos, Kenneth W., Petersburg, Alaska
Drake, James D. L., Vancouver, B. C., Canada
Drynan, Bruce W., Hathaway Pines, Calif.
Easton, Milton H., Salem, Ore.
Ellis, E. Ross, Berkeley, Calif.
Evans, Samuel S., Jr., Sandpoint, Idaho
Fields, John N., East Lansing, Mich.
Finnegan, Joseph E., El Paso, Tex.
Foote, Leonard E., Marietta, Ga.
Freeman, Emil A., Ruston, La.
Furnival, George M., Starkville, Miss.
Genscmer, Paul B., Jr., Las Vegas, N. M.
Gipple, O. Ben, Harrisburg, Pa.
Gutzman, Wilson C., Fort Duchesne, Utah
Hadd, Charles F., Seattle, Wash.
Hallsted, Clinton T., San Francisco, Calif.
Hansen, Lawrence G., San Francisco, Calif.
Heine, Henry C., Jr., Harrisburg, Ill.
Hernandez-Agosto, Miguel A., Las Piedras, Puerto Rico
Hester, Dwight A., Cedaredge, Colo.
Hillsamer, A. J., Lafayette, Ind.
Holweg, Arthur W., East Greenbush, N. Y.
Horn, John T., Libby, Mont.
Howell, J. Morris, Fort Collins, Colo.
Jobst, Frederick J., Charlottesville, Va.
Irvine, Robert M., Wardsboro, Vt.
Johnson, William C., Oakland, Calif.
Joy, Irwin E., Scotia, Calif.
Kinneer, Gerald U., Linden, Tex.
Korenkiewicz, Bartley L., Menominee, Mich.
Kozicky, Edward L., Ames, Iowa
Kozlowski, Theodore T., Amherst, Mass.
Kranzer, Herman C., Lansing, Mich.
Lathen, Clifford F., Moscow, Idaho
Linn, Edward R., Jr., Houston, Tex.
Loncar, Michael, Detroit, Mich.
Lumsden, George Q., Murray Hill, N. J.
Manross, James H., Syracuse, N. Y.
Marron, Joseph J., Jacksonville, Fla.
McAlvage, Edward M., Grants Pass, Ore.
McClure, Morris W., Fort Lauderdale, Fla.
McDaniel, Curtis M., Minden, La.
McDonald, Loren A., Park Falls, Wis.
Merrill, Bruce B., Dewey, S. Dak.
Meserve, Philmore W., Mechanic Falls, Maine
Miller, Benjamin F., Lowville, N. Y.
Morley, Robert M., Akeley, Minn.
Muehmore, Albert, Wise River, Mont.
Mullins, William H., Humboldt, Tenn.
Myles, George, Goshen, Va.
Nearn, William T., State College, Pa.
Newell, Fred W., Portland, Ore.
Odon, Jack C., Denham Springs, La.
Ohlman, Robert G., Poughkeepsie, N. Y.
Oppermann, G. L., Hemlock, N. Y.
Owen, Idwal H., Jr., Jacksonville, Fla.
Palmer, William M., Baton Rouge, La.
Parnelle, Robert E., Jr., Ocala, Fla.
Patronsky, Louis A., Ann Arbor, Mich.
Phillips, Raymond R., Dubuque, Iowa
Pickus, Theodore R., Levittown, N. Y.
Pierce, Milton A., Waverly, Va.
Radebach, John E., Jr., Osceola Mills, Pa.
Rapp, Edward, Limon, Costa Rica
Reagan, John F., Pontiac, Mich.
Reed, James F., Logansport, Ind.
Reid, Robert L., Fountain City, Tenn.
Relyea, Harold E., Joliet, Ill.
Robinson, John P., Poplar, Mont.
Rowland, Louis A., Jr., Oberlin, La.
Scheer, Robert L., Raleigh, N. C.
Schroeder, Richard L., New Rochelle, N. Y.
Senne, Clifford W., Waynesville, N. C.
Shaw, Robert W., Raleigh, N. C.
Smith, George E., Jr., Georgetown, S. C.
Smith, George W., Seattle, Wash.
Smith, Raymond E., Gary, Ind.
Sprague, LeRoy, Boise, Idaho
Stearns, Charles H., Syracuse, N. Y.
Stevens, Irwin E., Springfield, Ill.
Taylor, Harry J., Jr., Manteca, Calif.
Taylor, Jean, Hazlehurst, Ga.
Thompson, Alden, Jr., Berkeley, Calif.
Todd, Harold G., Zanesville, Ohio
Travis, John H., Hood River, Ore.
Turner, Charles L., Norfolk, Va.
Valentine, W. C., Baton Rouge, La.
Walters, Warren W., Berkeley, Calif.
Weeden, Edward S., Long Beach, Calif.
Wells, Sidney, Combined Locks, Wis.
Wenzel, O. G., Opportunity, Wash.
White, John W., Duluth, Minn.
Whitney, Ronald E., Durham, N. H.
Williams, Edward B., Nacogdoches, Tex.
Wykhuis, Grant H., Carp Lake, Mich.
Yarlett, Lewis L., College Station, Tex.
Zeigler, James L., Seattle, Wash.
Zimmerman, O. Paul, Rhinelander, Wis.

Affiliate Grade

Blanton, S. B., Moncks Corner, S. C.
Campbell, Charles P., Willits, Calif.
Coe, Robert H., Knoxville, Tenn.
English, Edwin S., Jr., Asheville, N. C.
Kessler, Jack S., Willits, Calif.
Miller, Henry G., Gaylord, Mich.
Olds, W. Glenn, New Martinsville, W. Va.
Seitz, R. J., Gastonia, N. C.
Siler, William, Fortuna, Calif.
Stewart, Allen M., Blountstown, Fla.
Terrell, Clifford E., Murphysboro, Ill.
Wilson, C. A., Glenwood, Wash.

Associate Grade

Cooper, Robert B., Ithaca, N. Y.
Schoder, Fred, Washington, D. C.

Forestry News

Forest Research Agreement Signed

Forest research studies, of wide application in the Northwest, will be carried out under an 8-year cooperative agreement signed by the Publishers Paper Company of Oregon City, Ore. and the U. S. Forest Service.

Under the agreement, the company will cut 40 million board feet of timber on the Cascade Head Experimental Forest at Otis on the Oregon coast. It will purchase the government timber at appraised prices and do the logging according to plans developed by the Forest Service. The company plans to start cutting on the first of eight units within the next few weeks.

This agreement is the first of its kind undertaken in the Northwest, and the first in the United States involving this large a volume of timber. Such agreements are provided for in the Federal McNary-McSweeney Research Act passed in 1928.

Details of this agreement were worked out by E. E. Matson, head of the Pacific Northwest Forest and Range Experiment Station's division of applied forest management research, and Henry Baldridge, timber manager for the company. The studies to be undertaken are the pilot plant stage in developing new forest management practices. Findings from small-scale basic research that appear to have promise will be tried out on a commercial-sized operation to see if they are economical. Detailed costs will be maintained on all phases of the operation.

Initial studies will test various types of clear and selective cutting in the coastal spruce-hemlock forests. Losses from wind throw on the edges of small cut-over blocks of timber land is a serious problem in that area. Different sizes, shapes, and arangements of these blocks will be tried out in an endeavor to reduce this loss.

The small cut-over blocks of land will be watched to see which restock best. It has been difficult to get new growth started on brushy areas common along the coast. These problem spots will be given special attention.

Tests are to be made using different methods of logging. Both horse logging and tractor logging will be tried out in the hope that cheaper logging methods can be developed that will not damage the remaining trees.

Much of the coast timber is far from markets and hauling costs approximate 1/3 of the total logging expense. If some practical method can be developed to reduce the weight of the logs, operating costs will be greatly reduced. Tests have shown that poisoning trees prior to felling helps to reduce their weight and to remove the bark. Since both of these items are important to pulp mills, poisoning tests will be given a thorough try.

Allen Steele Peck (1880-1951)

Colonel Allen Steele Peck, Rocky Mountain regional forester, U. S. Forest Service, from 1920-43, died of a heart attack February 4 while attending a lecture with his wife at Denver University Student Union.

Colonel Peck was born at West Barre, N. Y., April 17, 1880. A graduate of Union College, Schenectady, N. Y., and the School of Forestry of the University of Michigan, he started his forestry career as a student assistant on a survey party in Maine in 1902. The following year he was assigned to a crew making preliminary investigations which led to the establishment of planting programs in the Sand Hill region of western Nebraska, now known as the Nebraska National Forest. He was engaged in national forestry extension work until 1908 when he was transferred to Albuquerque, as regional chief of planting, and later as assistant district forester for the Southwest Region of the Forest Service.

From 1914 until the outbreak of World War I, he was an inspector in the division of operation in the Washington office of the Forest Service. He had 22 months of service overseas, first as a major with the 20th Forestry Engineers and later as Lieutenant colonel. He was awarded the Distinguished Service Medal, and was presented with the Legion of Honor Cross by the French Government.

Following World War I, he was named regional forester at Denver and served continuously in that position for 24 years.

He was a past president of the Colorado Engineering Council and Denver Boy Scouts Council, a former director of the Colorado Mountain Club, a member of the regional and national executive Council of Boy Scouts and Council of the Society of American Foresters, a member of the Society of American Military Engineers, Sons of American Revolution, Sigma Phi Society, University Club of Denver, Army and Navy Club of Washington, D. C., Denver Planning Commission, and Mile High Club of Denver, American Society of the French Legion of Honor, director of the Colorado Forestry and Horticulture Association, and vice-president of the American Forestry Association.

Emergency Action Taken in Adirondack Blow-down Area

On January 23, Governor Thomas E. Dewey signed an emergency bill, passed by the State Legislature, authorizing the salvage timber on some 400,000 acres in the Adirondack Forest Preserve. A fund of $200,000 was appropriated for the work, and the Governor urged prompt action to remove the serious fire hazard caused by the high winds of November 25. (See page 151 of the February 1951 JOURNAL for an earlier story.) Special legislation was needed because of the constitutional provision establishing the forest preserve stipulates that none of its resources shall be sold, removed, or destroyed.

Timber Sales Resumed After Temporary Halt

Sales of national forest timber, halted on January 29 pending establishment of a procedure to set ceiling prices in conformity with the recent price regulation, have been resumed by field offices of the U. S. Forest Service. Regional foresters have been instructed to permit the sale of national timber at prices not to exceed the highest stumpage rate paid in each region for each species-product class during the base period, December 19, 1950 to January 25, 1951. In the event several bidders offer the ceiling price, the sale will be awarded by lot.

If no sale for a particular species-product class was in effect during the base period, regional foresters will use the highest price offered during the base period as a ceiling.

Soil Conservation Speed-up Urged

The importance of soil conservation to national defense is emphasized by H. H. Bennett, chief of the Soil Conservation Service in his 1950 fiscal-year report to the Secretary of Agriculture. The report records accelerated conservation progress for the sixteenth straight year. It terms modern soil conservation which treats and uses the land according to need and capability, "an indispensable part of our first line of national defense."

"It seems to me," Dr. Bennett said, "that the very uncertainty of the world's political, economic, and military situations makes it imperative that we speed up our conservation work. In the near future, we must be able to say that our agricultural plant is stable and that its capacity for production, as far as we can see ahead, can be expanded to meet any anticipated needs without danger of serious damage to our future productive capacity."

To that end, the report sets as the Service's goal, completion of at least an average of 4 percent of the remaining conservation job on United States farmlands each of the next three fiscal years, working through farmers' soil conservation districts. That compares with 2.7 percent of the total remaining job done in the 1950 fiscal year. The soil conservation head expressed the belief that, with adequate facilities, the job of applying the basic conservation measures to the land could be completed in about 20 years, after which would remain the continuing task of maintaining the conservation improvements.

By June 30, 1950, the report shows, 18.6 percent of the conservation job had been completed, in addition to a considerable spread of unrecorded practices to farms both within soil conservation districts and outside. That is about one-fifth of the total job. In the 1950 fiscal year alone, basic conservation measures were applied to 26,071,342 acres. This was described as an increase of 388 percent—nearly five times as much work done—over 1942, for example, with operating facilities increased during this 8-year period by only about 50 percent.

Grazing Decision Confirmed

The Secretary of Agriculture has confirmed the decision of the Forest Service to reduce livestock grazing on certain portions of the Grand Mesa National Forest of Colorado.

The lands affected are situated east of Grand Junction, Colo. Last year, when the Forest Service notified permittees that forage conditions were unsatisfactory and required a reduction in livestock numbers on these allotments, the Grand Mesa Stockgrowers Association appealed the decision to Secretary Brannan.

The National Forest Advisory Board of Appeals made a study of the case. The findings of the board members and two independent range technicians indicate that a reduction in grazing use is needed as a step in rebuilding the range. "The chief interest of the stockmen and the Forest Service," Secretary Brannan said, "is to retain the grazing resources on these three allotments in a productive condition and to increase their forage yield."

He also pointed out that a number of other range restorative measures are needed on the ranges. He recommended such practices as rotation-deferred grazing, range riding to eliminate concentration of livestock, improved salt distribution, range seeding, and brush control.

Fewer Fires, More Acreage Burned on National Forest

Although there were fewer fires on national forests in 1950 than in 1949, the acreage burned was approximately 70 percent greater.

The annual summary of fire losses, prepared by Carl A. Gustafson, chief, Division of Fire Control, Forest Service, shows that 10,097 fires burned 330,531 acres on national forests in 1950. During the preceding year, 11,501 fires burned 194,590 acres.

"We suffered heavier fire losses on national forests, but this does not indicate that people are more careless in starting fires," Mr. Gustafson said. "Extremely bad burning conditions in the Southwest and in California made it difficult to bring fires under control."

From the standpoint of acreage burned, California had its worst fire season in 25 years. The number of fires on national forests dropped from 2,154 in 1949 to 1,914 in 1950, but owing to tinder dry conditions throughout the summer, the acreage burned shot up to 220,208 in 1950 as compared with 72,515 for 1949.

Because of six years of drought in California, extensive areas of watershed cover have died, thereby creating ideal conditions for large fires. The only recorded drought of longer duration in California was the seven-year drought of 1826-33.

Although human use of California's national forests has increased, the number of man-caused fires dropped from 1,220 in 1949 to 1,086 in 1950. The decrease in fires caused by smokers is especially noteworthy. In 1949, California smokers started 392 fires; in 1950, they started 318 fires.

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Weather Improvement Group Formed

"Everybody talks about the weather, but we do something about it!" was the official slogan of a meeting in Denver, January 11 and 12, when representatives of 10 non-profit groups sponsoring "cloud-seeding" programs in Colorado, New Mexico, Wyoming, Oregon, and Washington met at the Cosmopolitan Hotel to form a national association.

The meeting was called by Jim Wilson, landowner and agricultural writer of Fort Collins, Colo., who was named secretary and news-service chief of the new organization. Mr. Wilson, who is a member of the Explorers Club of New York and author of the book, *Three-Wheeling through Africa*, is also a director of the Northeast Colorado Water Development Association, a weather-improvement project covering 8,300,000 acres in the seven northeastern counties of Colorado.

The new group will be known as the National Weather Improvement Association. Other officers elected at the Denver meeting include Harvey Harris, rancher of Sterling, Colo., president; Oliver Dilling, Connel, Wash., wheat grower, first vice-president; Albert Mitchell, rancher and past president of the American Livestock Association, Albert, N. Mex., second vice-president; Don Aldrich, Eads, Colo., rancher and farmer, third vice-president; and Glenn Saunders, Denver Water Board attorney, treasurer. Each member association is represented on the board of directors.

Condor Refuge Approved

The Secretary of the Interior has approved an order withdrawing the nesting area of the rare California condor in the Los Padres National Forest from all forms of appropriation under the public land laws, with certain exceptions pertaining to gas and oil.

The terms of the withdrawal, totaling 35,200 acres, represent an adjustment between the interests of oil and gas operators and wildlife conservation organizations.

Public hearings developed the possibility of permitting oil and gas leasing on a substantial part of the area without disturbance to the condor nesting areas. About two-thirds of the area will be open to oil and gas leasing activities, under special stipulations which will prevent disturbance of condor nesting areas. The remaining one-third of the area, where the condor nests are close enough together to block up fairly solidly—together with choice additional nesting sites—will be entirely closed to surface access, although these lands too may be developed for oil and gas if it is possible to reach the deposits by directional drilling.

The U. S. Forest Service, which maintained a condor refuge in this area for several years, will continue to manage the area, but will have greater authority to exclude people.

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Boundaries of Enlarged Grand Teton National Park Defined

Boundaries of the enlarged Grand Teton National Park, Wyoming, established by act of Congress of September 14, 1950 (Public Law 787, 81st Congress), are defined in an order signed by Secretary of the Interior Oscar L. Chapman. To the park established in 1929, which contained 94,892 acres of federal land, are added all but approximately 9,100 acres of the former Jackson Hole National Monument, established in 1943 by Presidential Proclamation. The federal lands now in the park total 295,300 acres. Of the lands formerly in the monument not included in the park, approximately 2,800 acres were transferred by the 1950 park act to the Teton National Forest, and about 6,300 acres to the National Elk Refuge. Both the national forest and national elk refuge are contiguous to the park.

The John D. Rockefeller, Jr., gift of land (through Jackson Hole Preserve, Inc.) for addition to the Grand Teton National Park and Jackson Hole National Monument, made a little more than a year ago, amounted to 33,562 acres. Of this, about 31,000 acres are included in the enlarged park; approximately 2,140 acres are added to the National Elk Refuge and remain in federal ownership. In accordance with a clause included in the deed to the United States, ownership of 400 acres which was transferred to Teton National Forest has reverted to Jackson Hole Preserve, Inc.

The act specifies that during the transitional period while recreational facilities are being developed by the National Park Service payments out of park revenues must be made to compensate Teton County, Wyoming, for tax losses on lands acquired for park purposes. It also calls for the continuance, over a period of years, of existing leases or permits authorizing residential or grazing use of federal lands within the park and establishes other safeguards for the protection of ranchers who cross or use these lands. The act provides for the formulation of a program to insure the permanent conservation of elk within the park. This is to be a task performed by the Wyoming Fish and Game Commission and the National Park Service, on the basis of investigations conducted jointly by the two agencies. Any such program must have the joint approval of the Secretary of the Interior and the Governor of Wyoming.

Lake States Can Meet Timber Needs Through Better Forestry

The three Lake States of Minnesota, Wisconsin, and Michigan, which are heavy importers of timber, can meet all their needs for forest products if they carry out a long-range forest improvement program, according to a 64-page report, *Forest Resources of the Lake States Region*, prepared by R. N. Cunningham and the Forest Survey staff of the Lake States Forest Experiment Station, St. Paul Minn. The report summarizes several resource surveys conducted during the last 15 years.

The report declares that the Lake States, severely cut over in past years, could increase current timber growth 25 percent on forest areas by improved management and better utilization. Total timber production of the area could be doubled in 70 years.

Large acreages of young growth on the 50 million acres of forest and woodland in the three states have reached a stage where they will respond readily to improved care. Some forest areas are badly run down, but they are gradually becoming restocked as a result of improved fire protection and the extension of better management practices.

Despite these recent gains, the Lake States are still compelled to import half their sawn timber from other regions. They get pulpwood from Canada and the Rocky Mountains. They import utility poles, boxboards, and railroad ties from out-of-state sources.

Based on 1947 figures, a total of 101 paper mills and 46 pulp mills are operating in the three states. Pulpwood consumption has increased from less than one-half million cords in 1904 to 2.8 million cords in 1948. Paper mills turned out 3.8 million tons of paper and board in 1947, approximately 18 percent of the national total.

Annual timber consumption in the three states is estimated at 980 million cubic feet as compared with an output of timber products of only 675 million cubic feet, which indicates heavy dependency on outside sources. For saw timber alone, the annual consumption is 3 billion board feet, with only one-half this amount being produced in the Lake States.

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George Hunt Retires, J. Alfred Hall Heads Products Laboratory

George M. Hunt, director of the Forest Products Laboratory at Madison, Wis., will retire on March 31 after 40 years of continuous service in the U. S. Forest Service.

Mr. Hunt's successor will be Dr. J. Alfred Hall, director of the Pacific Northwest Forest and Range Experiment Station, in Portland, Oreg. Dr. Hall, in turn, will be succeeded by Robert W. Cowlin, present chief of the Division of Forest Economics at the Portland station.

Mr. Hunt is internationally recognized for his contributions in wood research. He is noted for his studies dealing with wood preservation, painting, gluing, and fireproofing. He has been at the Forest Products Laboratory since 1914 and has served as director of the institution for the last five years.

Dr. Hall, who will succeed Mr. Hunt, has been director of the Pacific Northwest Forest and Range Experiment Station since 1945. During World War II, he worked in the Washington office of the Forest Service as a consultant in the production of rubber from guayule.

Dr. Hall's first assignment with the Forest Service in 1930 was at the Forest Products Laboratory, where he served as a senior biochemist for seven years.

From 1937 to 1942 Dr. Hall was director of the Central States Forest Experiment Station at Columbus, Ohio. Prior to his employment with the Forest Service, he worked for the Liggett & Meyers Tobacco Company, the California Fruit Growers Exchange, and General Foods.

Mr. Cowlin, who will become director of the Portland research station, has served at the Pacific Northwest Forest and Range Experiment Station since 1929.

Forest Service Trains Winter Sports Men

The U. S. Forest Service is trying to make skiing safer and better on the national forests. A school to train Forest Service men to handle winter sports on the national forests of the Northwest was held on the south slopes of Mount Hood in January. Fifteen forest rangers and other administrative men from nine national forests and the Portland regional office received instructions from a panel of experts.

The first winter sports school to be held in the Northwest took off to a snowy start January 15 at the Summit Guard Station on the Mount Hood National Forest. Subjects studied by the "snow rangers" include area administration, avalanche prediction, avalanche control, advanced first aid, ski mountaineering, ski instruction.

Conway Joins Wood Preserving Company

Emmett A. Conway, Chillicothe, Ohio, has been named assistant to the general superintendent of the McArthur Division of The Baker Wood Preserving Company.

Mr. Conway has been associated with the Division of Forestry of The Ohio Agricultural Experiment Station almost continuously since 1939. He is a graduate of the School of Forestry, University of Michigan.

During the period between 1941 and 1948, Conway served as forest ranger of the Zaleski State Forest in Vinton County, Ohio. For the past three years he has been stationed in Chillicothe. He has just completed the first extensive sawtimber inventory ever made of all of Ohio's state forests. This work is expected to serve as the basis for the expansion of forest management activities on the state forests.

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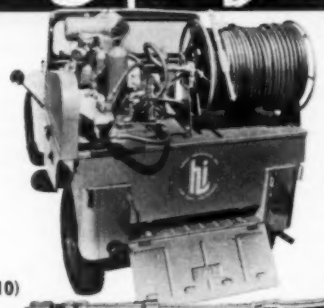

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Agriculturists for Foreign Work Under Point IV

The U. S. Department of Agriculture is recruiting technical agriculturists to do foreign assignments for the Technical Assistance program, the so-called "Point IV" program. This work is designed to assist the economically underdeveloped areas of the world.

Agriculturists employed will do research and extension work in cooperation with foreign governments. Greatest need is for agriculturists trained in research or extension phases of the following subject-matter fields: *Soils and Forestry*, including soil conservationists, soils scientists, and foresters; *Crops*, including agronomists, biochemists, botanists, geneticists, and horticulturists; *Animal Husbandry*, including veterinarians and animal breeding; *Pest and Disease Control*, including entomologists, pathologists, parasitologists; *Agricultural Engineering* including agricultural engineers, irrigation engineers, and rural electrification engineers; *Economics, marketing;* and *Social Science*, including agricultural economists, rural sociologists, and marketing specialists.

Programs are in operation or planned in the Latin American republics, Africa, the Near East, and the Far East.

Travel expenses for applicant and dependents will be paid by the government. Appointments made are exempt from Civil Service examination requirements. Candidates preferably should be from 30 to 50 years of age. Salaries range from $5370 to $10,330 a year. Employees also may receive post differentials and quarters' allowances, as well as the special Foreign Service health benefits.

Agriculturists interested should write or fill out a Form 57, and then send it to the U. S. Department of Agriculture, Office of Personnel, Washington 25, D. C.

Consulting Foresters Install New Officers

At its annual meeting, held in Washington, D. C. December 13, 1950, the Association of Consulting Foresters installed the following officers: Robert Moore, Danville, Pa., president; T. M. Howerton, Jr., Madison, Fla., vice-president; J. Atwood Whitman, Glendon, N. C., secretary-treasurer.

Members of the Executive Committee are: Edward Stuart, Jr., Hertford, N. C., Clinton Peltier, Reading, Calif., and Halsey M. Hicks, Brattleboro, Vt.

Association activities in 1951 will be centered around the work of four committees: An award committee to consider recognition of persons who have contributed to private forestry enterprise; a publicity committee, to promote the profession generally; a legislative committee, to keep consultants abreast of state and federal legislation of interest to forestry; and a committee on ethics to study means of improving and developing standards for consultants.

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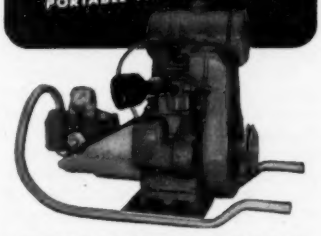

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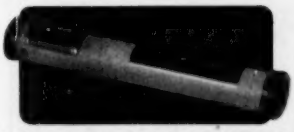

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WILBUR B. DEVALL has been appointed head of the Department of Forestry, Alabama Polytechnic Institute at Auburn, according to an announcement by President Ralph B. Draughon.

Prof. DeVall had been serving as acting head since the resignation last fall of Dr. T. D. Stevens who left to return to Michigan State College. A graduate of the New York State College of Forestry in 1937, Prof. DeVall went to the University of Florida as a teaching fellow, obtaining his master's degree there in 1941, subsequently rising to assistant professor.

During the war he served with the Timber Production War Project in Florida, and later joined the forestry faculty at Alabama Polytechnic Institute. This college was recently accredited for forestry instruction by the Council of the Society of American Foresters.

Root Rot of Woody Plants in Southeast

Clitocybe, a root rot disease of fruit, forest, shade, and ornamental trees, shrubs, and vines, is discussed in a new U. S. Department of Agriculture publication, Circular No. 853.

The disease covers much territory—then whole southeastern area from Texas to the District of Columbia and Florida, the only state in which it has been studied extensively. It was first observed in Oklahoma 50 years ago. In the Florida studies, the Division of Forest Pathology in cooperation with state authorities found a total of 210 species subject to attack.

The circular, titled "Clitocybe Root Rot of Wood Plants in the Southeast United States," takes up preventive and remedial measures, including surgical treatment, uncovering and aeration of infected root systems to kill off the fungus, and banking up the bases of trees to stimulate the formation of new roots.

AFA Elects Everest

D. C. Everest, chairman of the board Marathon Corporation, Rothschild, Wis., has been elected to the presidency of the American Forestry Association. He succeeds A. C. Spurr of the Monongahela Power Company, Fairmont, W. Va., who served during 1949 and 1950.

A recipient of an American Forestry Association conservation award in 1949, Mr. Everest has long been a leading forestry conservationist among mid-west industrialists. He helped influence the establishment of the U. S. Forest Products Laboratory at Madison, Wis., and has done much to promote its growth to present size and usefulness.

Before becoming chairman of the Marathon Corporation Board, he served as president and general manager of the same company. He is also a director in several other wood-using industries and is actively connected with the Masonite Corporation. Other organizations to which he has given much help include the American Paper and Pulp Association and the Institute of Paper Chemistry.

New directors elected were George W. Dean, state forester of Virginia and Edward P. Stamm, logging manager, Crown Zellerbach Corporation, Oregon. Samuel T. Dana, dean, School of Natural Resources, University of Michigan, and George W. Merck, president, Vermont Forest and Farmland Foundation, were reelected.

Montana Ranks Fifth in Nation in Forest Resources

The first state-wide, comprehensive survey of Montana's forests shows that the state ranks fifth in the nation in forest resources with a total volume of 56 billion board feet of sawtimber on 22 million acres of forest land.

Publication of a report, *Montana Forest Resource and Industry Statistics*, was announced by Dr. George M. Jemison, director of the Forest Service's Northern Rocky Mountain Forest and Range Experiment Station, Missoula, Mont. For the first time, timber resource information based on a field survey is available for the entire State of Montana.

The 48-page report, prepared by P. D. Kemp and M. B. Dickerman reveals that the annual growth of timber in Montana is greater than the annual drain in all major species except ponderosa pine. The report points out that Montana offers excellent opportunities for the expansion of wood-using industries.

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Edward S. Bryant (1883-1951)

Edward Sohier Bryant of Bolton, Vt., died in Cambridge, Mass. on January 22 after a year of ill health. He was 67 years of age.

Born August 6, 1883 at Cohasset, Mass., Mr. Bryant took a short course at the Yale School of Forestry summer camp at Milford, Pa., in 1903. He was graduated from Harvard University in 1906 with the A.B. degree, and from Harvard Forest in 1907 with the M.F. degree.

In July 1907 he became one of the original members of the firm of Fisher, Cary, and Bryant, consulting foresters. During the period 1914-1917, he was a forest inspector in the U.S. Forest Service assisting in private cooperative forest work. He served in the first world war in France with the 10th Engineers, attaining the rank of captain.

On his return to civilian life he became consulting forester for five years to Finch, Pruyn and Company of Glens Falls, N. Y., and thereafter continued to do consulting work in New England. He was the owner of an extensive timber tract near Bolton, Vt., where he was working on a ski development. ,

A Member of the Society of American Foresters since 1913, he was also on the executive committee of the Massachusetts Forest and Park Association, and was one of the original members of the New England Forestry Foundation.

Two California Foresters Retire

Wallace I. Hutchinson (the "Ranger Bill" of many a yarn) and William S. Price, widely known timber sales inspector, were retired from the U. S. Forest Service on December 31.

The "Ranger Bill" nickname fastened on Hutchinson after he created the character of that name to typify the U. S. forest ranger in stories and radio scripts. He had been assistant regional forester in charge of information and education work in the California region since 1922.

After working his way through Yale School of Forestry, Hutchinson started 48 years ago in what is now the U. S. Forest Service. Then came four years with the Philippine Bureau of Forestry—keeping several jumps ahead of head-hunting Moros while cruising jungle forests and helping introduce rubber trees on Mindanao Island.

Returning to the states, he was a forest ranger in Colorado, 1909-15, and supervisor of San Isabel National Forest there, 1915-17. He started the information and education section at Denver, and went to Washington, D. C. on similar work in 1920. In 1922 he became assistant regional forester at San Francisco. In 1948 the California Conservation Council presented its conservation award to Hutchinson for "farseeing leadership in the effort to promote cooperation in and understanding of conservation practices."

"Bill" Price is known to almost every lumber operator in California, as his 31 years in the Forest Service were all in that region. He was a sawmill supervisor in Louisiana and an infantryman in World War I before starting as a log-scaler in the Plumas National Forest in 1919. After further experience in the Lassen and Stanislaus forests, he returned to the Plumas as timber sales chief for two years, then was promoted in 1932 to regional inspector of timber sales, working out of San Francisco headquarters. During the 1933 depression, he was a code enforcement officer for NRA.

Traveling through most of California's timber country in the last 18 years, Price has examined hundreds of sales of national forest timber to lumber companies. He settled complaints on the ground, checked the accuracy of Forest Service scalers, and trained a new generation of scalers for this region.

Nordwall Named Rocky Mountain Recreation Chief

David S. Nordwall, for the past two years supervisor of the Medicine Bow National Forest, Laramie, Wyo., has been appointed new chief of the division of recreation, lands, and watershed management, Rocky Mountain Region, U. S. Forest Service.

He succeeds Clare W. Hendee. Hendee, since November 1946 in charge of that division in the Denver office of the service, has been promoted to the position of regional forester of the California Region, with headquarters in San Francisco.

Nordwall, a graduate of Michigan State College, entered the Forest Service in 1933, on the Arapaho National Forest, later transferring to the Harney, in South Dakota.

In 1937 he was promoted to assistant supervisorship of the old Holy Cross forest, and in 1942 served in the same capacity on the Medicine Bow.

He then spent two years as forester, in the regional office in Denver, transferring to the Washington office in 1945 as administrative officer, division of operation. He was made supervisor of the Medicine Bow in 1948.

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Fellowships in Silviculture

Harvard University announces the Richard Thornton Fisher Research Fellowships designed to encourage study and research in silviculture. Three fellowships with fixed stipends of $2,000 each are available. They are to defray the expenses of tuition, living, and incidental travel for a period of approximately 15 months. The fellowships will enable students to matriculate in the Harvard Graduate School of Arts and Sciences, and to work in residence toward a master's degree in forestry, or toward a doctor's degree in biology with particular reference to silvicultural problems.

The fellowships are open to those who hold bachelor's degrees from undergraduate schools of forestry or from colleges of liberal arts. Graduates of the latter schools must have majored in biological science.

Applications must be filed with the Graduate School of Arts and Sciences, 24 Quincy St., Cambridge 38, Massachusetts by April 1. Further information and application blanks may be obtained from the office of the Graduate School or from the Director of the Harvard Forest, Petersham, Massachusetts.

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Ball, Chief of Operations in Milwaukee Office

Donald R. Ball has been appointed chief of the division of operation in the regional office of the U. S. Forest Service at Milwaukee, Wis. He replaces Mayhew H. Davis, who has been transferred to Albuquerque, N. Mex. to head the division of operation in the southwestern region of the Forest Service.

Ball has had wide experience in various positions in the north central region. He entered the service in Wisconsin in 1929 as a ranger on the Chequamegon National Forest, where he later served as assistant supervisor. As assistant director of the regional training school at Eagle River from 1935 to 1936, at the peak of the Civilian Conservation Corps program, he was influential in the training of more than 300 technical foresters and administrators.

From 1937 to 1946 he served as assistant supervisor of the Superior forest in Minnesota, the largest forest in the region. During the next four years, as supervisor at Rhinelander, Wis., he established an outstanding record in developing the timber resources of the Nicolet forest. Since January 1950 he has been in charge of the Milwaukee regional office division of recreation, lands, watershed management, wildlife, and grazing.

New Northwest Publications

Two recent publications have been issued by the Pacific Northwest Forest and Range Experiment Station. They are *Financial Aspects of Pruning* by Elmer W. Shaw and George R. Staebler (45 pages); and *A Guide for Forest Soil Examination in the Douglas-Fir Region* by Robert F. Tarrant (38 pages).

Both publications may be obtained free on request to the station. The address is 423 U. S. Court House, Portland 5, Oreg.

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More than 750 persons attended the Wake County forestry demonstration held on the T. B. Jones' farm woodlands near Apex, N. C. on January 16. The demonstration was sponsored by the Seaboard Airline Railroad Company. L. Y. Ballentine is North Carolina's Commissioner of Agriculture. Foresters participating on the program were: Fred Claridge, R. A. Morin, P. A. Griffiths, Bob Scherer, and Jim Hubbard, of the North Carolina Forest Service; and John Gray, extension forester; and R. N. Hoskins, forester for the Seaboard Airline Railroad.

Northwest Foresters Recognized

The *Oregonian*, Portland, Oreg., the leading newspaper of the Pacific Northwest, celebrated its 100th anniversary in December 1950. As a part of this observance, the paper conducted a canvass on "The 100 Men of the Century." The names of four foresters appear in this vote, which was carried out by a special panel of Northwest newspapers, leading citizens, and others.

The only forester's name to be included in the final list of 100 Men of the Century is that of Edward T. Allen, one of the Founders of the Society of American Foresters, and an outstanding forester for many years of the Pacific Northwest. The final list of 100 included no living persons.

In the honorable mention list were two foresters—George W. Peavy, Fellow, and long-time dean of the Forestry School at Corvallis, Oreg.; and W. B. Osborne, pioneer in the scientific study of forest fire behavior. Among the list of persons submitted for consideration was that of Lyle F. Watts, former regional forester of the North Pacific Region, Fellow of the Society, and now chief forester, U. S. Forest Service.

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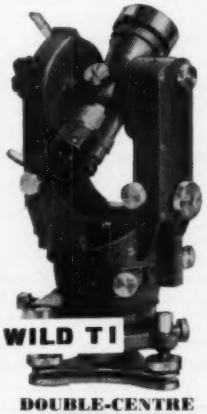

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National Forest Receipts Reach New High

National forest receipts for the last six months of 1950 reached a new high of $27,076,959. This represents an increase of nearly 70 percent over the receipts of $15,974,769 for the same period in 1949.

Greatest gains were shown in collections from the sale of saw timber and other forest products. During the 6-month period ended December 31, 1950, $26,434,861 was deposited in the U. S. Treasury from the sale of these national forest resources, as compared with $15,287,080 deposited for the same period a year ago.

National forests reported a record-breaking cut of 2,891,957,000 board feet of timber in the last half of 1950, an increase of 763,080,000 board feet over the corresponding period in 1949.

Taking second place in national forest receipts for the half year are collections from land use. Rental of lands to individuals and organizations for recreation facilities, camp sites, organization camps, and rights-of-way netted the Forest Service $333,627 as compared with $304,949 taken in during the last six months of 1949. The rental of reservoir sites brought in $14,121.

Fees collected from the grazing of cattle, sheep, and horses on national forest lands dropped from $370,413 for the last half of 1949 to $294,349 in 1950. It is expected grazing fees will total more than $3 million by the end of the current fiscal year.

Surveying and Mapping Group to Meet in June

The American Congress on Surveying and Mapping will hold its eleventh annual meeting on June 18, 19, and 20 at the Shoreham Hotel, Washington, D. C. The ACSM is a nonprofit association, organized to advance the sciences of surveying and mapping in furtherance of the public welfare and in the interests of those who use maps and surveys and those who make them.

The ACSM has formed six technical divisions, one of which is concerned with surveying and mapping education. This division is developing the program for the June meeting which is directed to the interests of education in the use of maps, map compilation, and production. Exhibits of maps, charts, aerial photography, and surveying and mapping instruments and equipment will be featured at the meeting.

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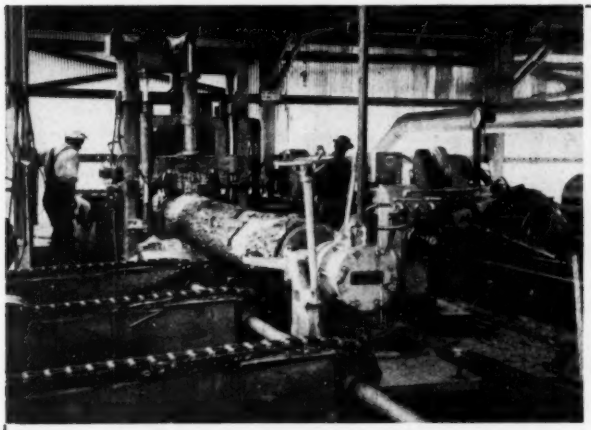

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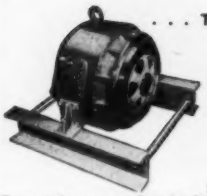

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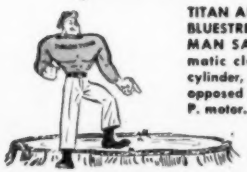

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